DVP-CX860/CX870D

RMT-D123A/D123P/D124A

SERVICE MANUAL

Self Diagnosis Supported model

US Model
Canadian Model
DVP-CX860/CX870D

AEP Model
UK Model
DVP-CX860

Photo : DVP-CX860
RMT-D123A

SPECIFICATIONS

CD/DVD player

Laser Semiconductor laser

Signal format system
NTSC: CX860: US,CND / CX870D
PAL (NTSC): CX860: AEP,UK

Audio characteristics

Frequency response
DVD (PCM 96 kHz): 2 Hz to 44 kHz
(±1.0 dB)* : CX860, (±0.5 dB) : CX870D
DVD (PCM 48 kHz): 2 Hz to 22 kHz
(±0.5 dB)
CD: 2 Hz to 20 kHz (±0.5 dB)

Signal-to-noise ratio
More than 110 dB: CX860
More than 115 dB: CX870D
(AUDIO OUT connectors only)

Harmonic distortion
Less than 0.003 % : CX860
Less than 0.0025 % : CX870D

Dynamic range
More than 100 dB (DVD)
More than 97 dB (CD): CX860
More than 98 dB (CD): CX870D

Wow and flutter
Less than detected value
(±0.001% W PEAK)

Outputs/Inputs

	Jack type	Output/input level	Load impedance
AUDIO OUT (1, 2)	Phono jacks	2 Vrms (at 50 kilohms)	Over 10 kilohms
DIGITAL OUT (OPTICAL)	Optical output connector	–18 dBm	Wave length: 660 nm
DIGITAL OUT (COAXIAL)	Phono jack	0.5 Vp-p	75 ohms terminated
VIDEO OUTPUT (1, 2)*1 OUTPUT (1)*2	Phono jacks	1.0 Vp-p	75 ohms, sync negative
S VIDEO OUTPUT (1, 2)*1	4-pin mini DIN	Y: 1.0 Vp-p C: 0.286 Vp-p*1	75 ohms, sync negative 75 ohms terminated
OUTPUT (1)*2		C: 0.3 Vp-p*2	75 ohms terminated
COMPONENT VIDEO OUT (Y, PB, PR)	Phono jacks	Y: 1.0 Vp-p PB, PR: 0.7 Vp-p	75 ohms, sync negative 75 ohms
S-LINK*3 (CONTROL S IN)	Mini jack	–	–
WOOFER OUT*3	Phono jack	2 Vrms (at 50 kilohms)	Over 10 kilohms
5.1 CH OUTPUT*4	Phono jack	2 Vrms (at 10 kilohms)	Over 10 kilohms
MEGA CONTROL	Mini jack	–	–
AUDIO IN*1 AUDIO IN*2 (R, L)	Phono jack	2 Vrms	47 kilohms

*1 CX860: US,CND / CX870D
*2 CX860: AEP,UK
*3 CX860: US,CND,AEP / CX870D
*4 CX870D

General

Power requirements
120 V AC, 60 Hz (CX860: US,CND / CX870D),
220 – 240 V AC, 50 / 60 Hz (CX860: AEP,UK),

Power consumption
18 W (CX860: US,CND),
19W (CX860: AEP,UK), 20W (CX870D)

Dimensions (approx.)
430 × 158 × 415 mm (17 × 6 1/4 × 16 3/8 in.)
(w / h / d) incl. projecting parts

Mass (approx.)
7.0 kg (15 lb 7 oz)

Operating temperature
5 °C to 35 °C (41 °F to 95 °F)

Operating humidity
25 % to 80 %

Supplied accessories

- Audio / video / S-link (control S) connecting cord (1)
- S video cord (1)
- Remote commander (remote)
  RMT-D123A (1)(CX860: US,CND)
  RMT-D123P (1)(CX860: AEP,UK)
  RMT-D124A (1)(CX870D)
- Size AA (R6) batteries (2)

* *The signals from AUDIO OUT connectors are measured. When you play PCM sound tracks with a 96 kHz sampling frequency, the output signals from the DIGITAL OUT (OPTICAL, COAXIAL) are converted to 48 kHz (sampling frequency).*

Design and specifications are subject to change without notice.

- Abbreviation
  CND: Canadian model

ENERGY STAR® is a U.S. registered mark.
As an ENERGY STAR® Partner, Sony Corporation has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

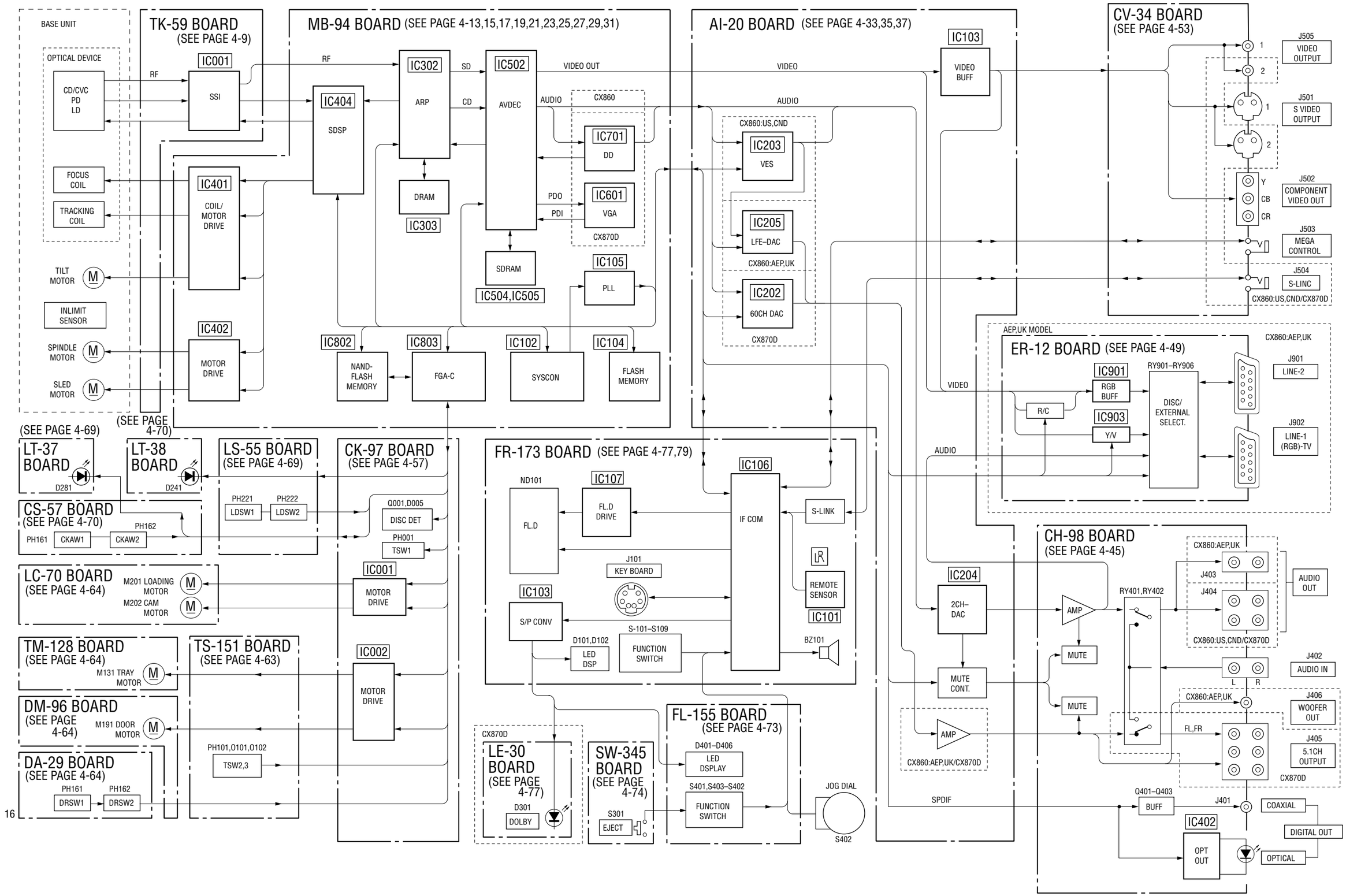
DVD VIDEO COMPACT disc DIGITAL VIDEO

CD/DVD PLAYER

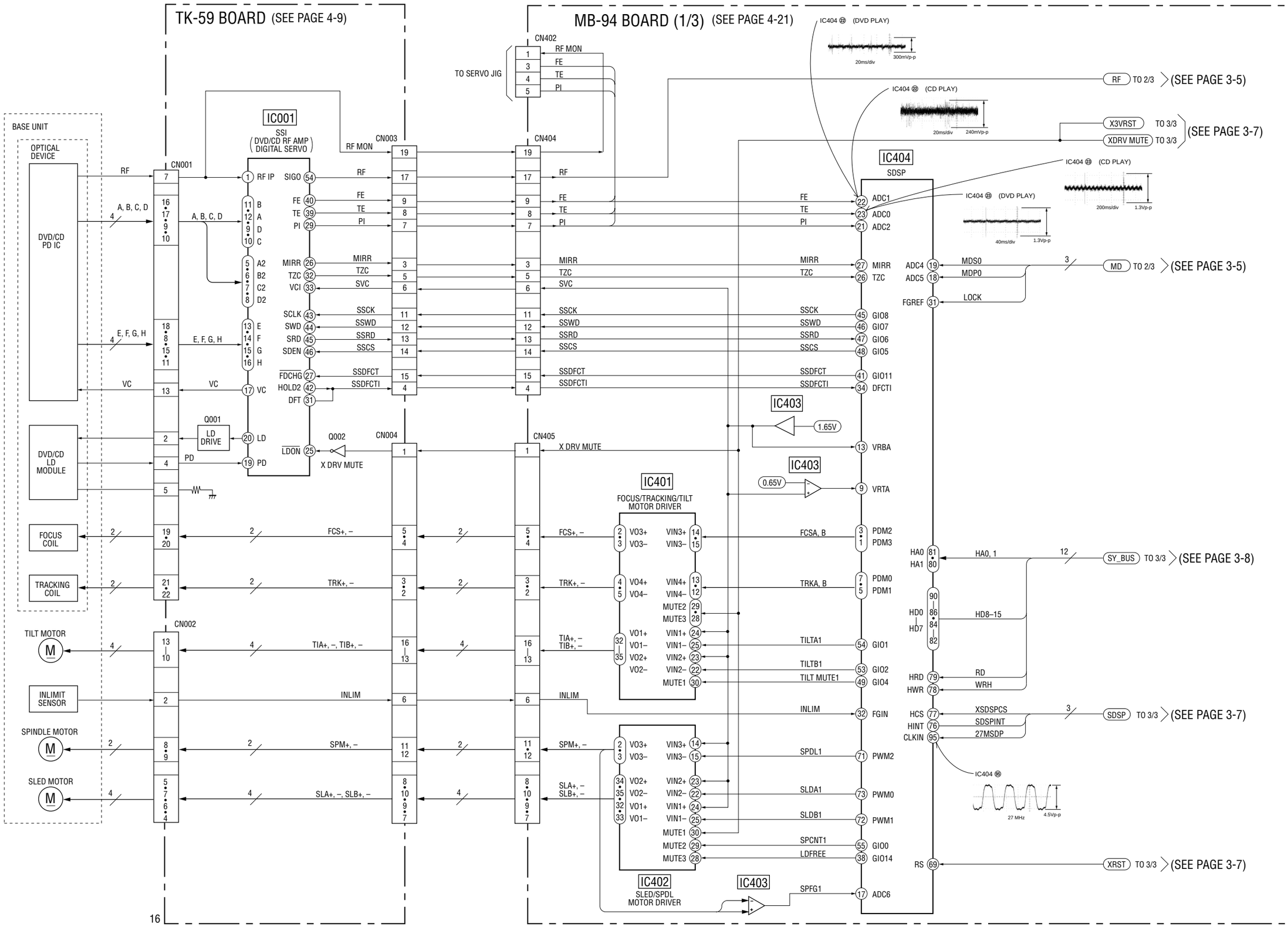
SONY®

SECTION 3
BLOCK DIAGRAMS

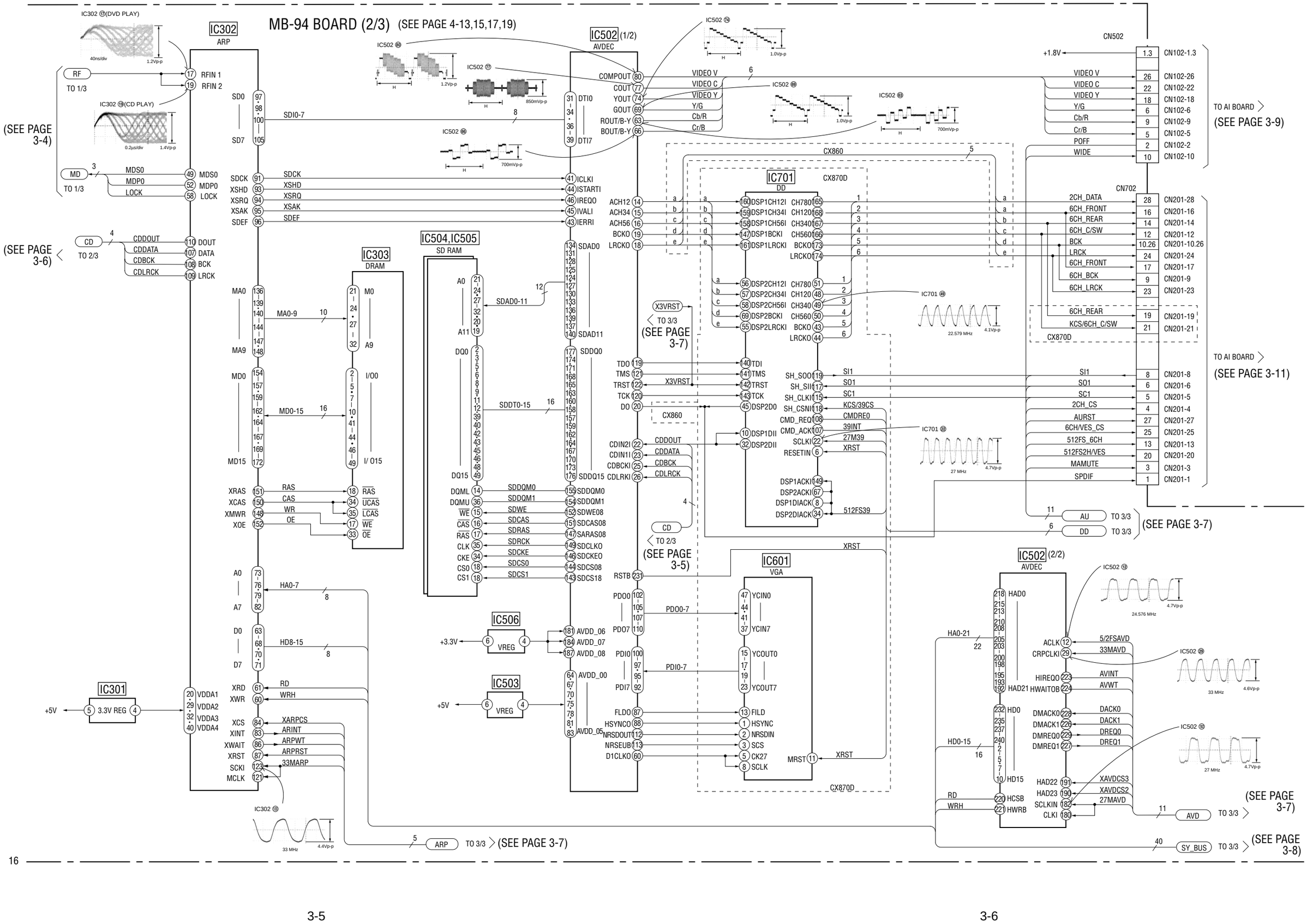
3-1. OVERALL BLOCK DIAGRAM



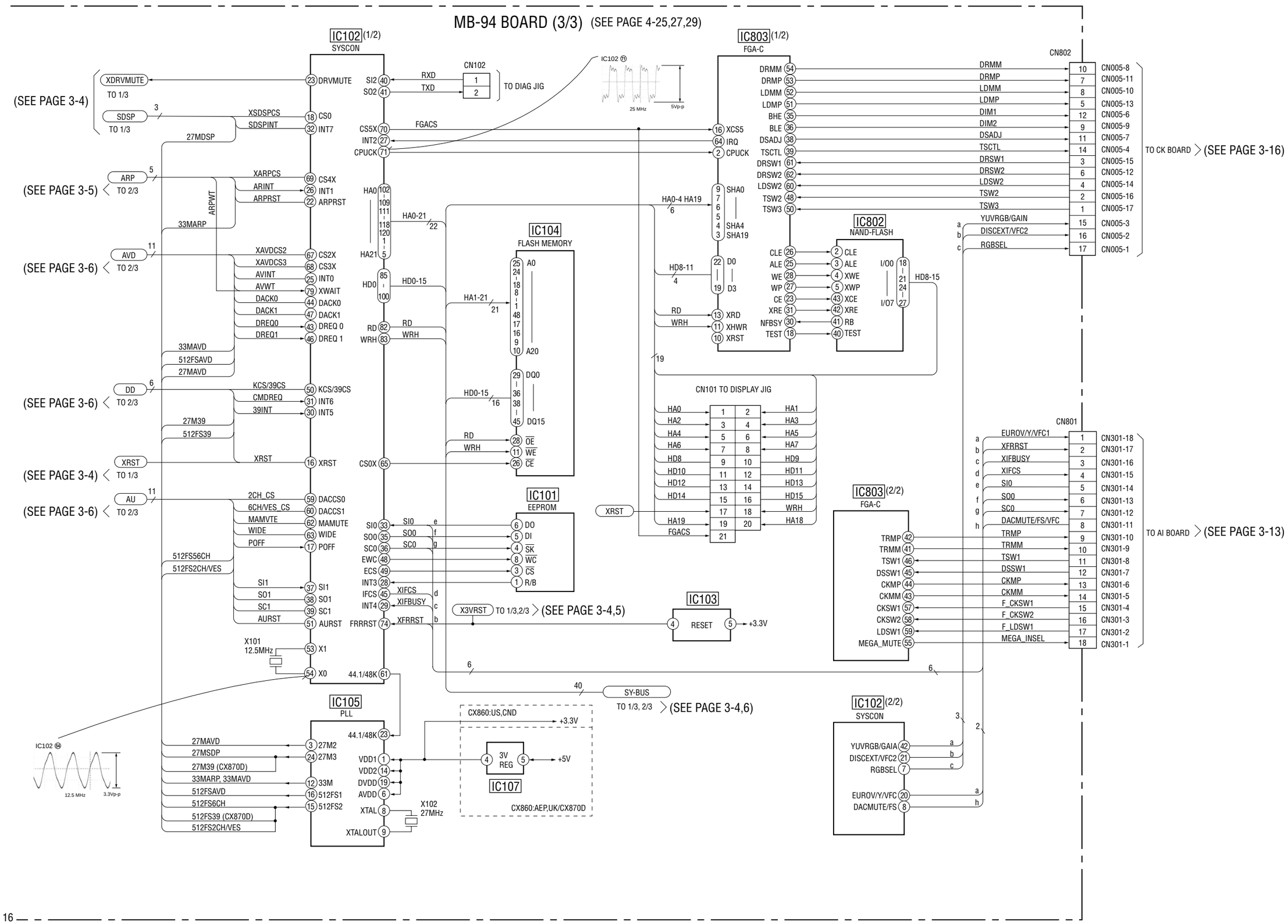
3-2. RF/SERVO BLOCK DIAGRAM



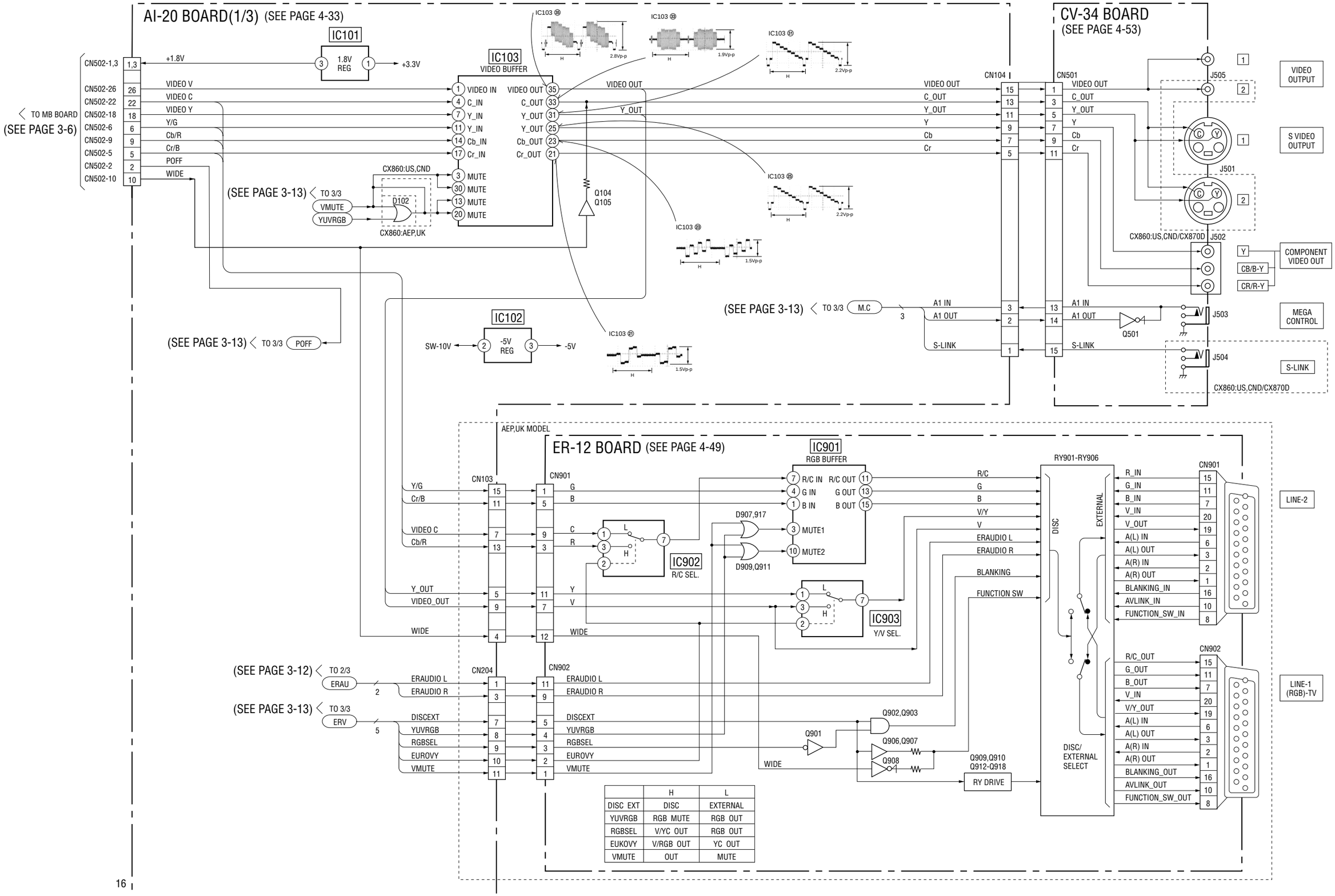
3-3. SIGNAL PROCESS BLOCK DIAGRAM



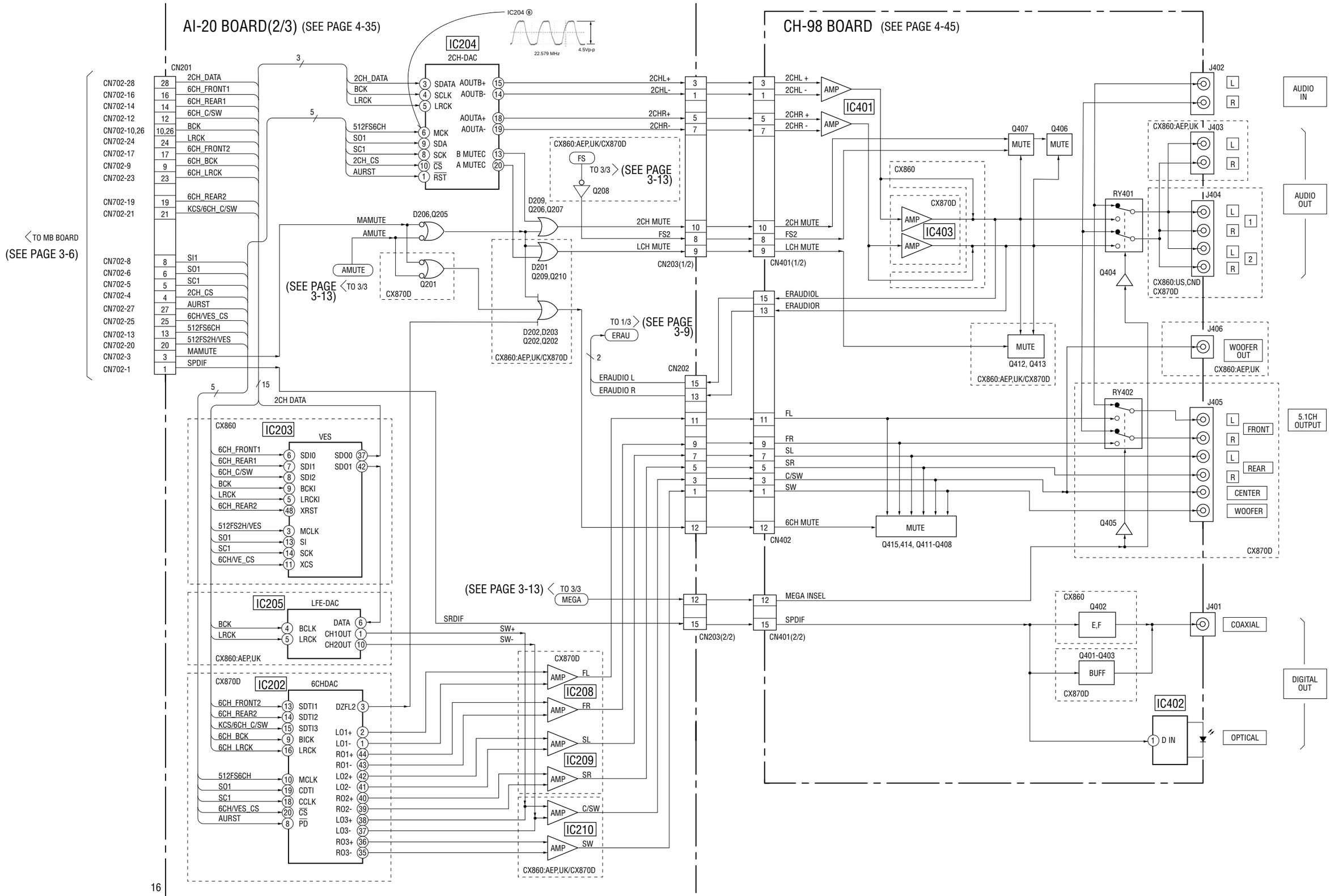
3-4. SYSTEM CONTROL BLOCK DIAGRAM



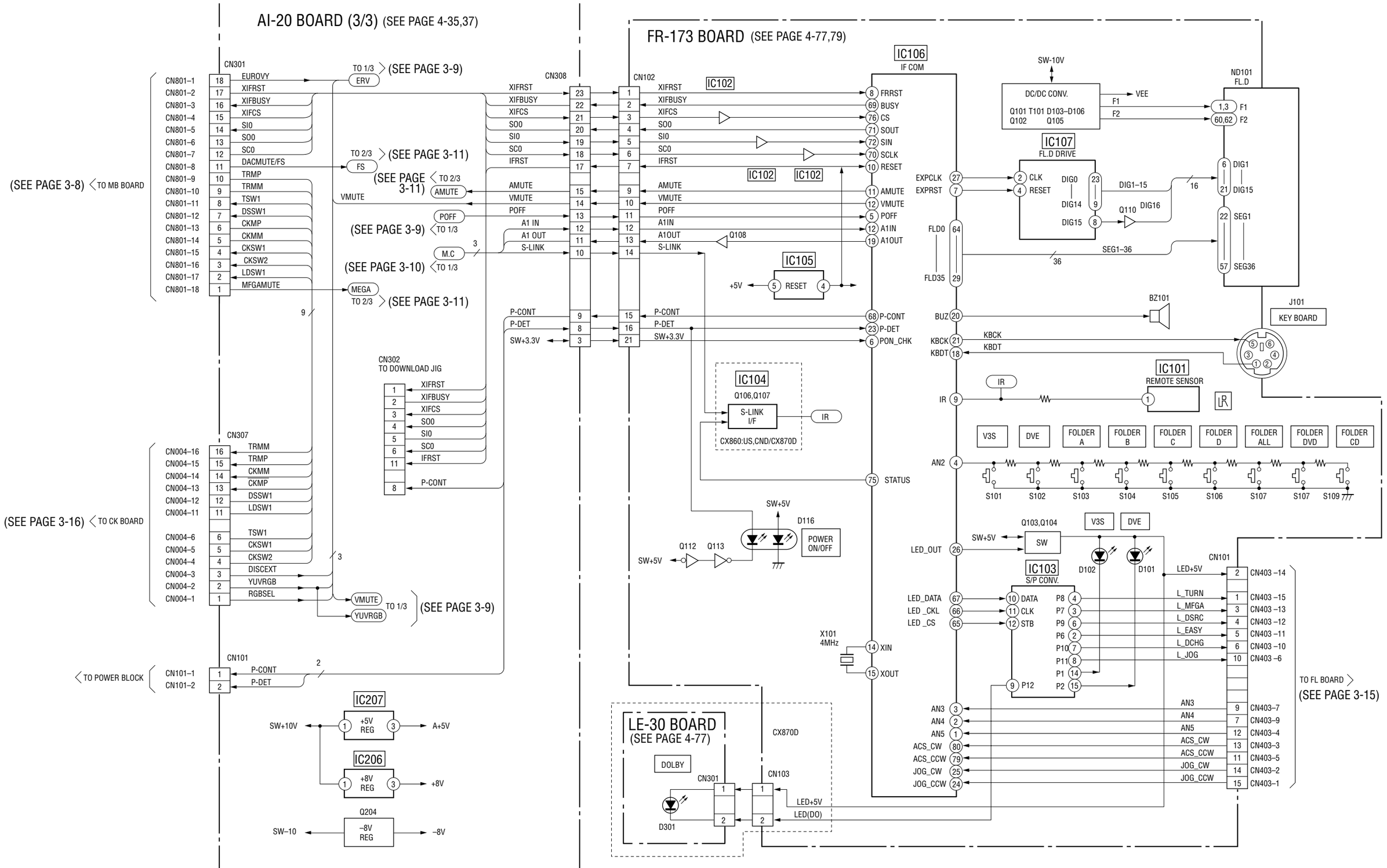
3-5. VIDEO EURO BLOCK DIAGRAM



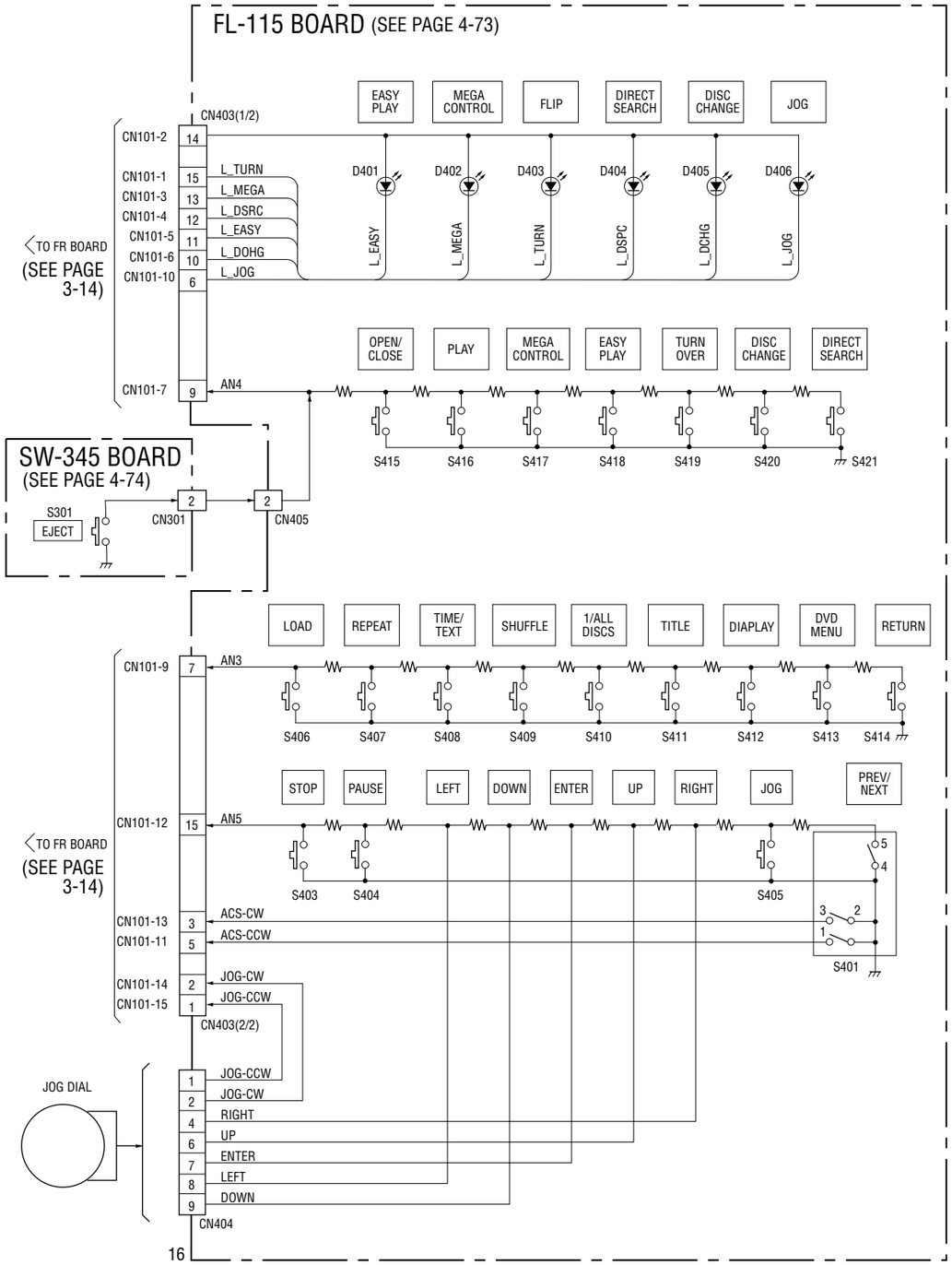
3-6. AUDIO BLOCK DIAGRAM

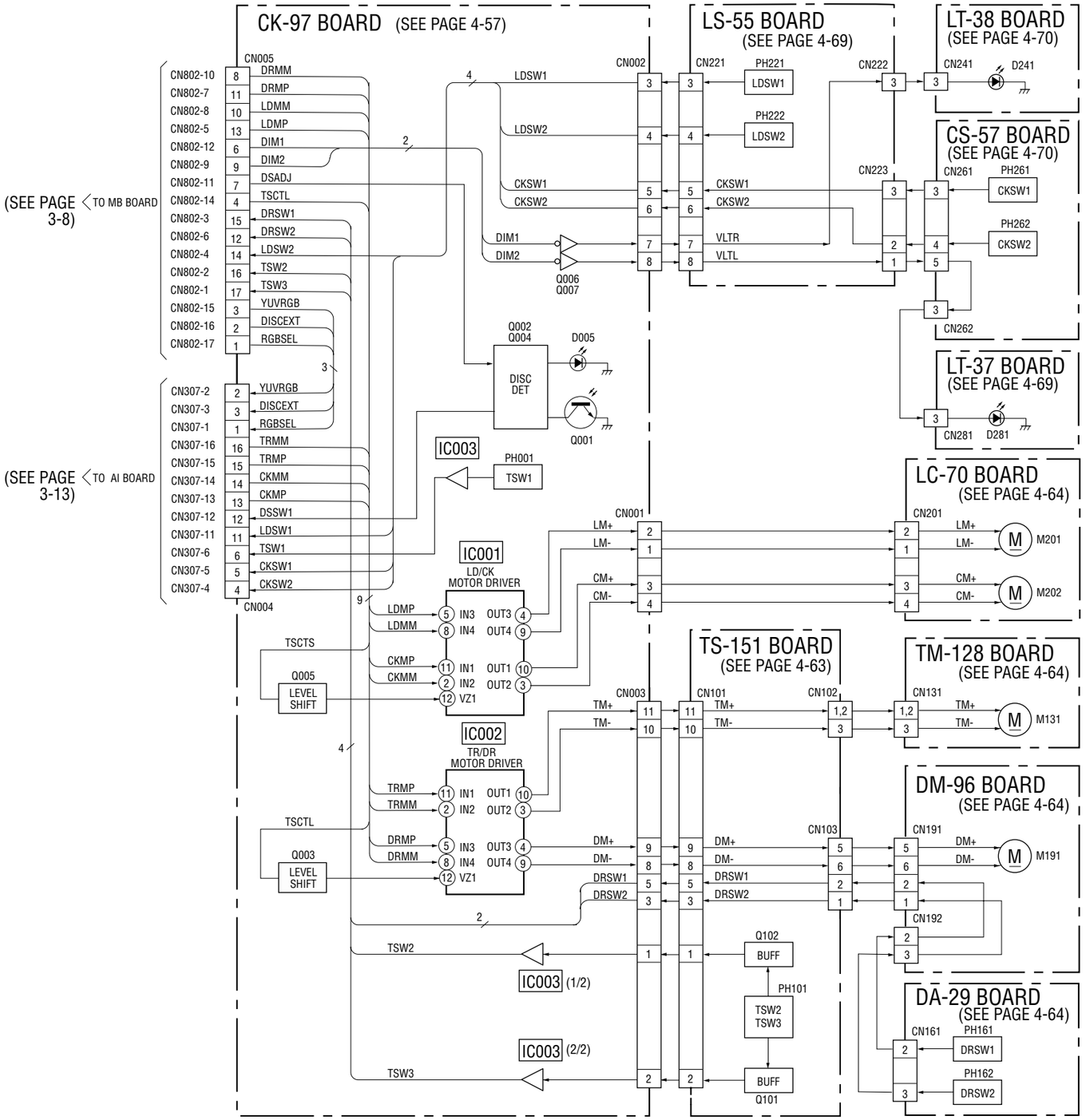


3-7. INTERFACE CONTROL BLOCK DIAGRAM (1/2)

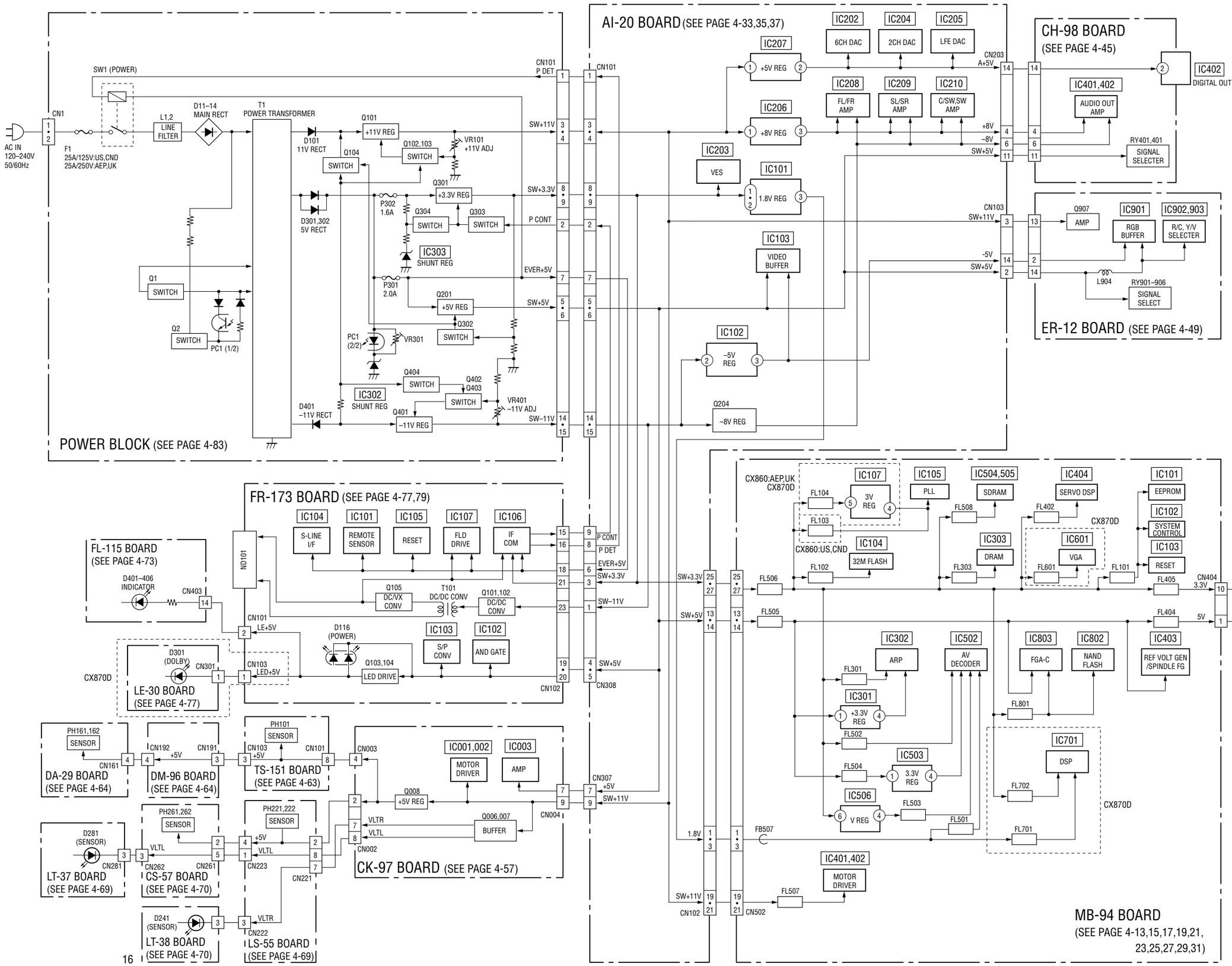


3-8. INTERFACE CONTROL BLOCK DIAGRAM (2/2)



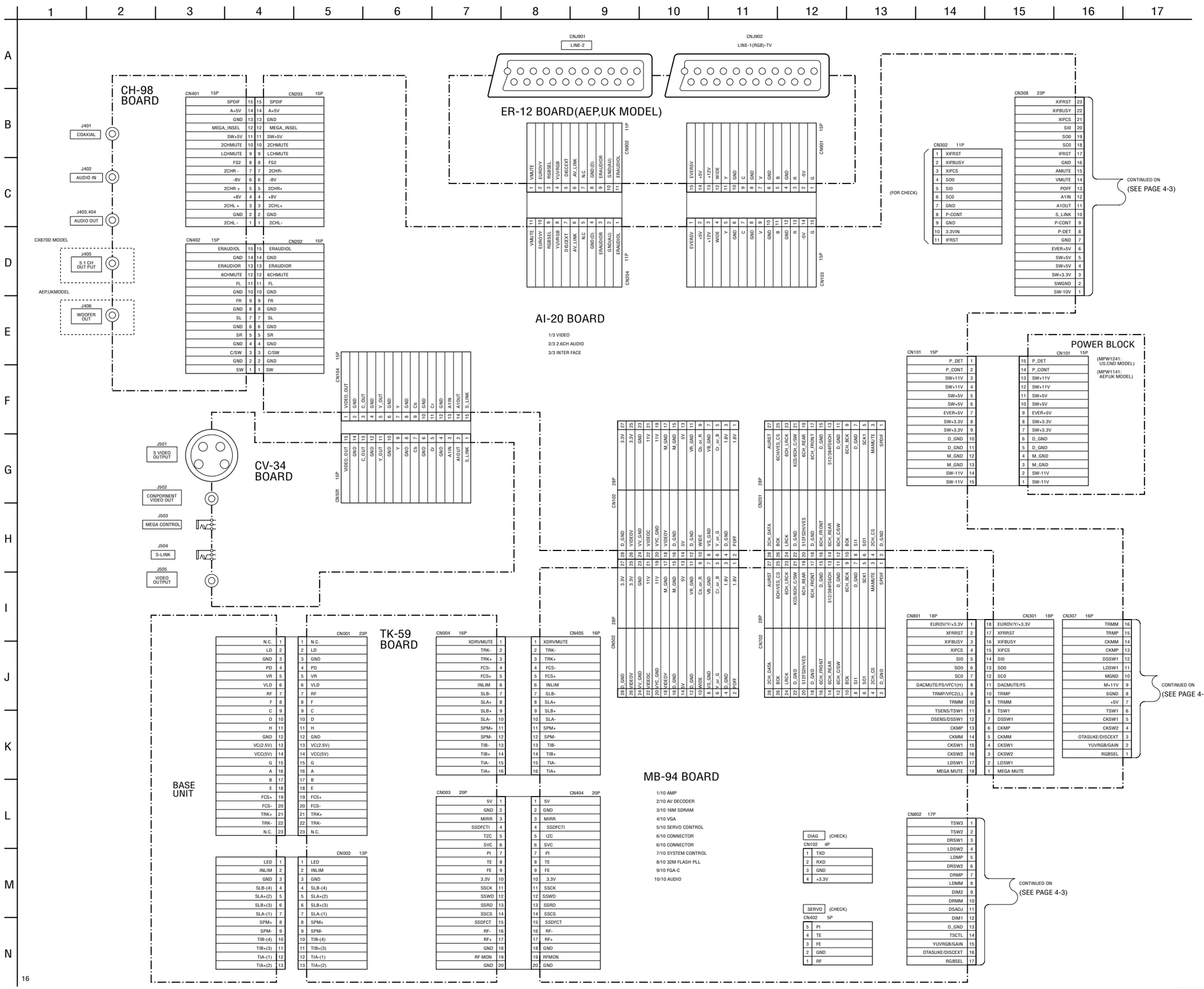


3-9. POWER BLOCK DIAGRAM

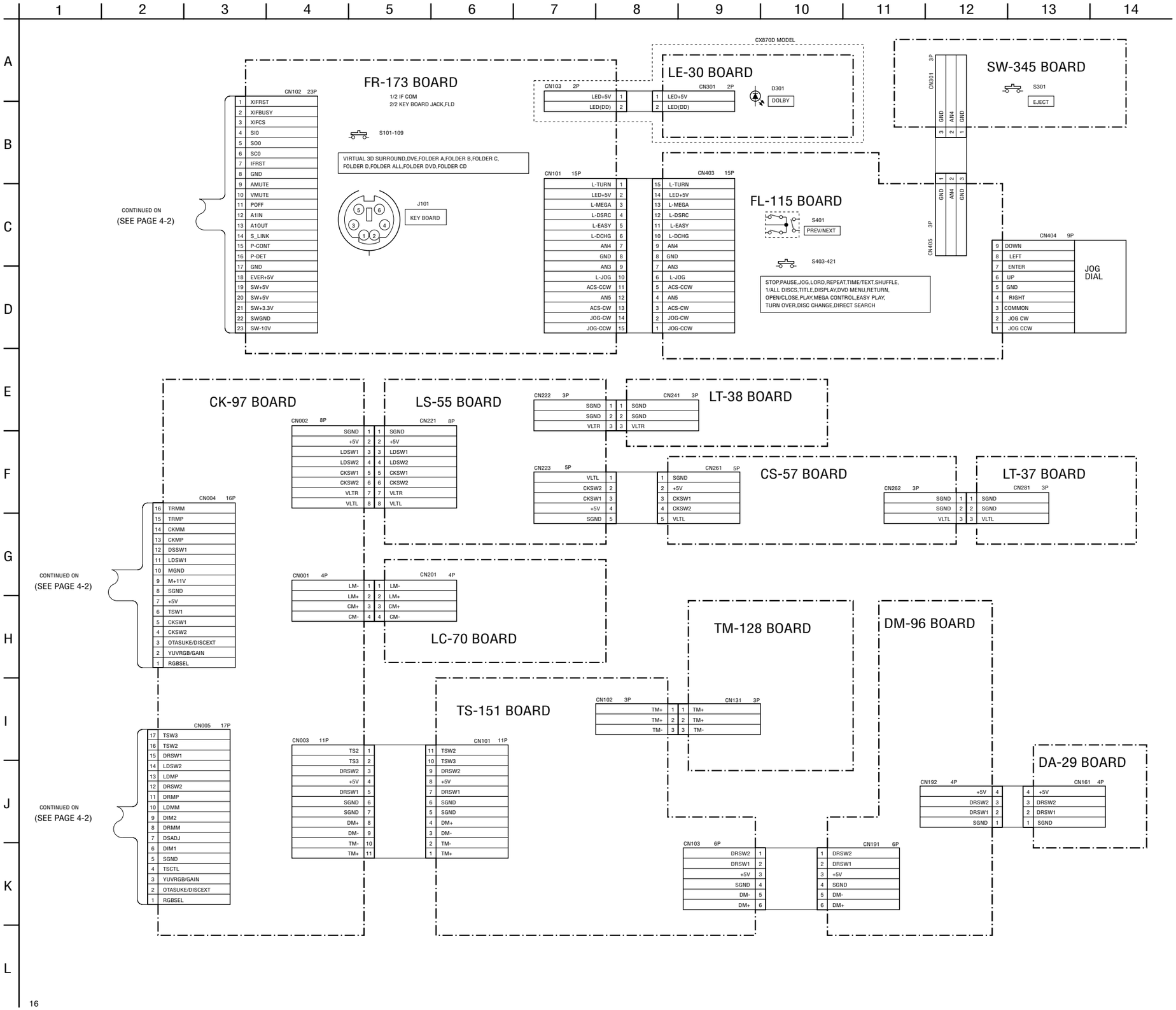


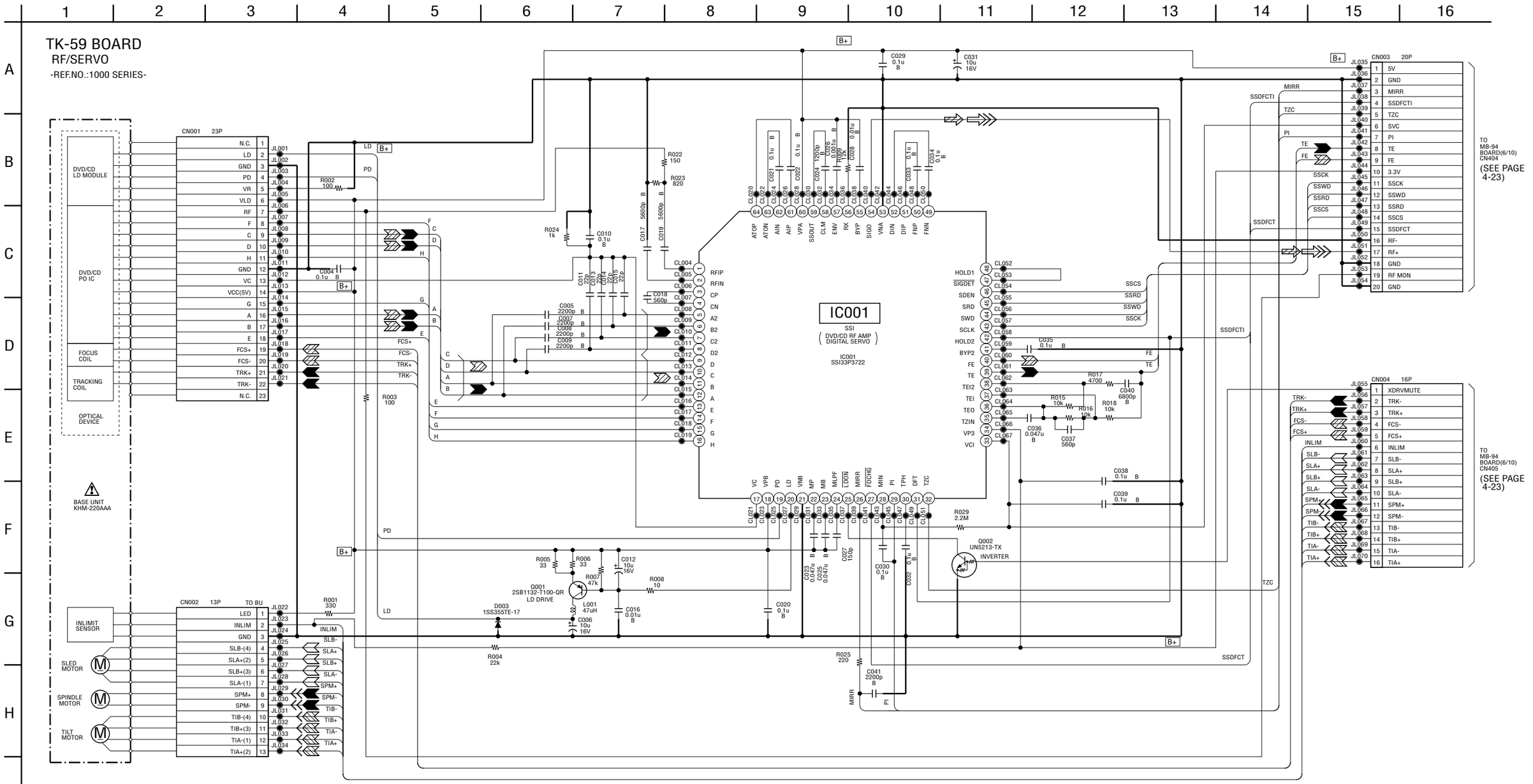
SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM (1/2)


CH-98 BOARD
CN401 15P
CN203 15P
SPDIF 15 15 SPDIF
A+5V 14 14 A+5V
GND 13 13 GND
MEGA_INSEL 12 12 MEGA_INSEL
SW+5V 11 11 SW+5V
2CHMUTE 10 10 2CHMUTE
LCHMUTE 9 9 LCHMUTE
FS2 8 8 FS2
2CHR - 7 7 2CHR-
-8V 6 6 -8V
2CHR + 5 5 2CHR+
+8V 4 4 +8V
2CHL + 3 3 2CHL+
GND 2 2 GND
2CHL - 1 1 2CHL-
CN402 15P
CN202 15P
ERAUDIOL 15 15 ERAUDIOL
GND 14 14 GND
ERAUDIOR 13 13 ERAUDIOR
6CHMUTE 12 12 6CHMUTE
FL 11 11 FL
GND 10 10 GND
FR 9 9 FR
GND 8 8 GND
SL 7 7 SL
GND 6 6 GND
SR 5 5 SR
GND 4 4 GND
C/SW 3 3 C/SW
GND 2 2 GND
SW 1 1 SW
J401 COAXIAL
J402 AUDIO IN
J403,404 AUDIO OUT
CX870D MODEL
J405 5.1 CH OUT PUT
AEP,UKMODEL
J406 WOOFER OUT
CNJ901 LINE-2
CNJ902 LINE-1(RGB)-TV
ER-12 BOARD(AEP,UK MODEL)
CN902 11P
VMUTE EUROVY REBSEL YUVRGB DSCSKT AV_LINK NC GND(D) ERAUDIOR GND(AU) ERAUDIOL
CN901 15P
EVERSV +5V +12V WIDE Y GND C GND V GND B GND R -5V G
CN204 11P
CN103 15P
AI-20 BOARD
1/3 VIDEO
2/3 2.6CH AUDIO
3/3 INTER FACE
CN104 15P
VIDEO_OUT GND C_OUT GND Y_OUT GND Y GND Cb GND Cr GND A1IN A1OUT S_LINK
CN501 15P
J501 S VIDEO OUTPUT
J502 CONPORNENT VIDEO OUT
J503 MEGA CONTROL
J504 S-LINK
J505 VIDEO OUTPUT
CV-34 BOARD
CN102 28P
3.3V 3.3V GND 11V 11V M_GND M_GND 5V VR_GND Db_or_R Dr_or_B VB_GND Cr_or_G Y_or_G D_GND PSPF
D_GND VIDEOV VV_GND VIDEOC VVC_GND VIDEOY M_GND D_GND 5V D_GND WIDE VS_GND Cb_or_B Cr_or_R D_GND +8V
CN001 28P
AURST 6CHVSS_CS 6CH_LRCK KCS/6CH_CSW 6CH_REAR 6CH_FRONT D_GND 512/384FS6CH D_GND 6CH_BCK D_GND SCK1 MAMUTE SPDIF
2CH_DATA BCK LRCK 512FSEHVSS D_GND 6CH_FRONT D_GND 6CH_REAR D_GND 6CH_C/SW BCK SI1 SO1 2CH_CS D_GND
CN002 28P
3.3V 3.3V GND 11V 11V M_GND M_GND 5V VR_GND Cb_or_R VB_GND Cr_or_G 1.8V 1.8V D_GND PSPF
D_GND VIDEOV VV_GND VIDEOC VVC_GND VIDEOY M_GND D_GND 5V D_GND WIDE VS_GND Y_or_G Cr_or_B D_GND +8V
CN702 28P
AURST 6CHVSS_CS 6CH_LRCK KCS/6CH_C/SW 6CH_REAR 6CH_FRONT D_GND 512/384FS6CH D_GND 6CH_BCK D_GND SCK1 MAMUTE SPDIF
2CH_DATA BCK LRCK 512FSEHVSS D_GND 6CH_FRONT D_GND 6CH_REAR D_GND 6CH_C/SW BCK SI1 SO1 2CH_CS D_GND
CN302 11P
XIFRST XIFBUSY XIFCS SIO SCO GND P-CONT GND 3.3VIN IFRST
(FOR CHECK)
CN308 23P
XIFRST XIFBUSY XIFCS SIO SOO SCO IFRST GND AMUTE VMUTE POFF A1IN A1OUT S_LINK P-CONT P-DET GND EVER+5V SW+5V SW+5V SW+3.3V SWGND SW-10V
CONTINUED ON (SEE PAGE 4-3)
POWER BLOCK
CN101 15P
P_DET P_CONT SW+11V SW+11V SW+5V SW+5V EVER+5V SW+3.3V SW+3.3V D_GND D_GND M_GND M_GND SW-11V SW-11V
(MPW1241: US,CND MODEL)
(MPW1141: AEP,UK MODEL)
TK-59 BOARD
CN001 23P
N.C. LD GND PD VR VLD RF F C D H GND VC(2.5V) VCC(5V) G A B E FCS+ FCS- TRK+ TRK- N.C.
CN002 13P
LED INLIM GND SLB-(4) SLA+(2) SLB+(3) SLA-(1) SPM+ SPM- TIB-(4) TIB+(3) TIA-(1) TIA+(2)
CN004 16P
CN405 16P
XDRVMUTE TRK- TRK+ FCS- FCS+ INLIM SLB- SLA+ SLB+ SLA- SPM+ SPM- TIB- TIB+ TIA- TIA+
CN003 20P
CN404 20P
5V GND MIRR SSDFCTI TZC SVC PI TE FE 3.3V SSCK SSWD SSRD SSCS SSDFCT RF- RF+ GND RF MON GND
BASE UNIT
MB-94 BOARD
1/10 AMP
2/10 AV DECODER
3/10 16M SDRAM
4/10 VGA
5/10 SERVO CONTROL
6/10 CONNECTOR
6/10 CONNECTOR
7/10 SYSTEM CONTROL
8/10 32M FLASH PLL
9/10 FGA-C
10/10 AUDIO
DIAG (CHECK)
CN102 4P
TXD RXD GND +3.3V
SERVO (CHECK)
CN402 5P
PI TE FE GND RF
CN801 18P
EUROV/Y/+3.3V XFRRST XIFBUSY XIFCS SI0 SO0 SC0 DACMUTE/FS/VFC1(H) TRMP/VFC2(L) TRMM TSENS/TSW1 DSENS/DSSW1 CKMP CKMM CKSW1 CKSW2 LDSW1 MEGA MUTE
CN301 18P
EUROV/Y/+3.3V XFRRST XIFBUSY XIFCS SI0 SO0 SC0 DACMUTE/FS TRMP SGND +5V TSW1 DSSW1 CKMP CKMM CKSW1 CKSW2 LDSW1 MEGA MUTE
CN307 16P
TRMM TRMP CKMM CKMP DSSW1 LDSW1 MGND M+11V SGND +5V TSW1 CKSW1 CKSW2 OTASUKE/DISCEXT YUVRGB/GAIN RGBSEL
CONTINUED ON (SEE PAGE 4-3)
CN802 17P
TSW3 TSW2 DRSW1 LDSW2 LDMP DRSW2 DRMP LDMM DIM2 DRMM DSADJ DIM1 D_GND TSCTL YUVRGB/GAIN OTASUKE/DISCEXT RGBSEL
CONTINUED ON (SEE PAGE 4-3)

FRAME SCHEMATIC DIAGRAM (2/2)





Note :	Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
PB			⇨	⇨

SPINDLE SERVO (SPEED AND PHASE)	➡
TRACKING SERVO DVD/CD CDV	➡
SLED SERVO DVD/CD	⇨
FOCUS SERVO	⇨
SKEW SERVO DVD/CD	⇨

MB-94 BOARD(1/10)

ARP

-REF.NO.:10000 SERIES-
NO MARK:PB MODE

IC301
+3.3V REG
IC301
NJM2370U33-TE2

IC303
16M DRAM
IC303 GM71V18160CT-6TR

IC302
ARP
IC302
CXD9576R

MB-94 BOARD (1/10)

③ IC302 ⑰ (DVD PLAY)
40ns/div
1.2Vp-p

④ IC302 ⑲ (CD PLAY)
0.2µs/div
1.4Vp-p

⑤ IC302 ⑫③
33 MHz
4.4Vp-p

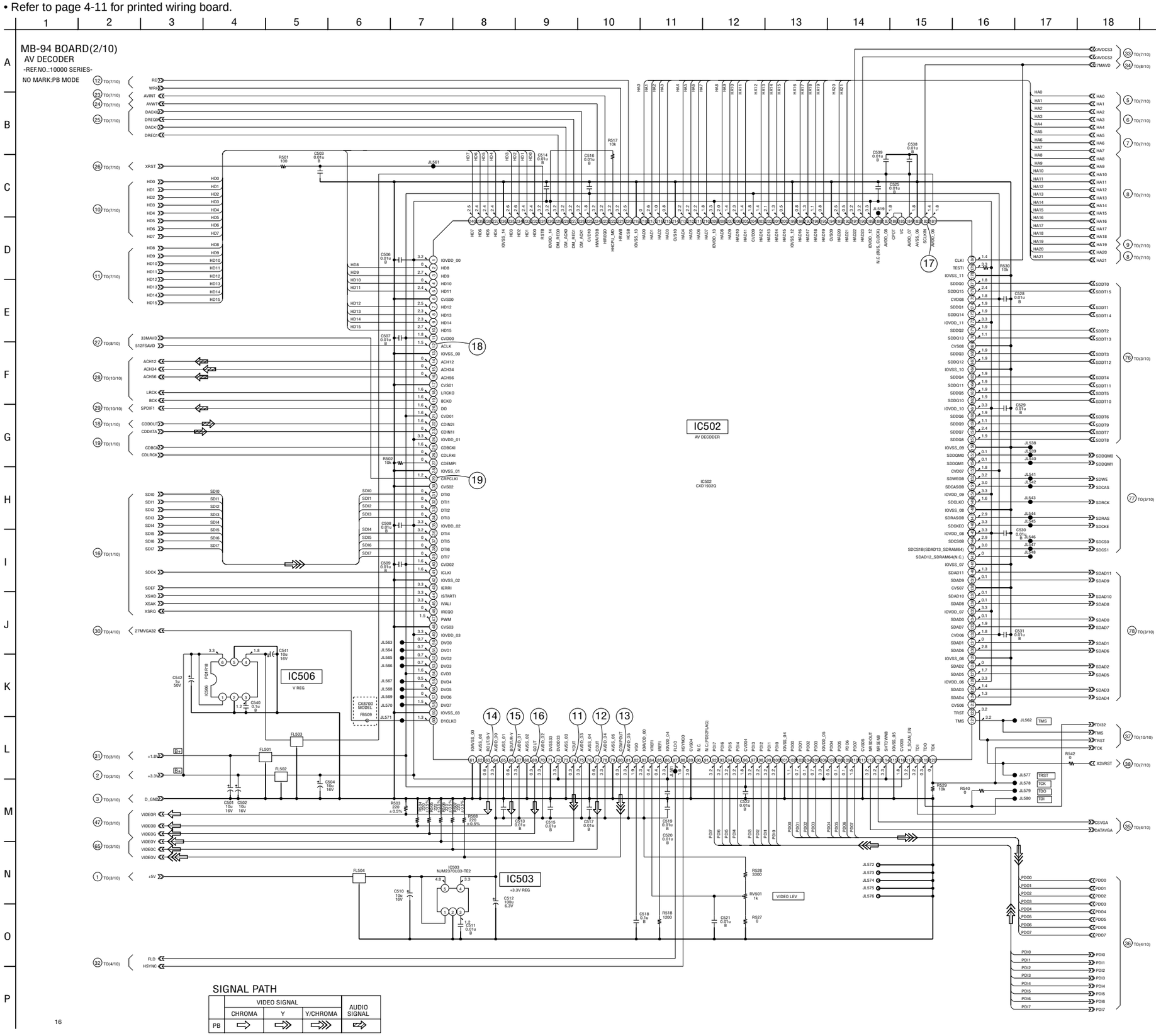
SIGNAL PATH

	VIDEO SIGNAL / Y/CHROMA	AUDIO SIGNAL
PB	⇨	⇨

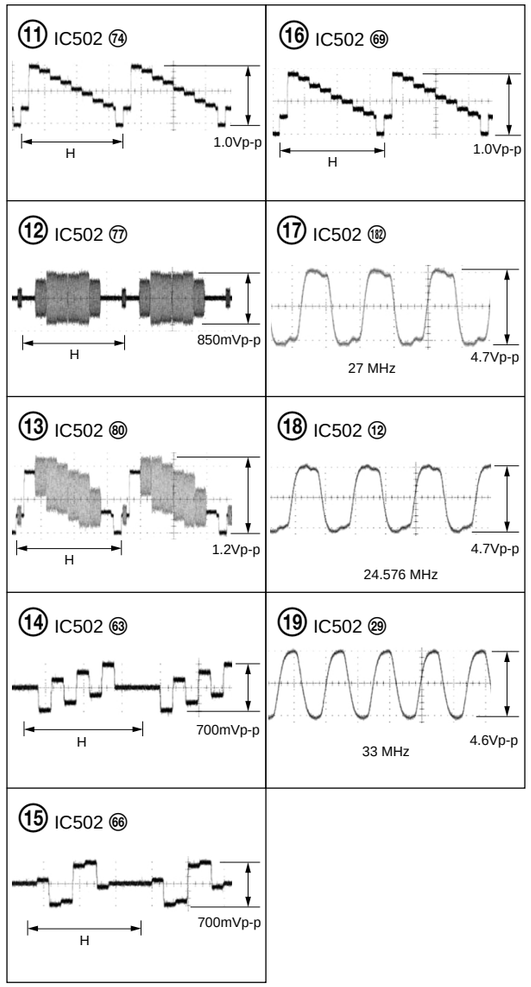
SPINDLE SERVO (SPEED AND PHASE) ⇨

For Schematic Diagram

• Refer to page 4-11 for printed wiring board.



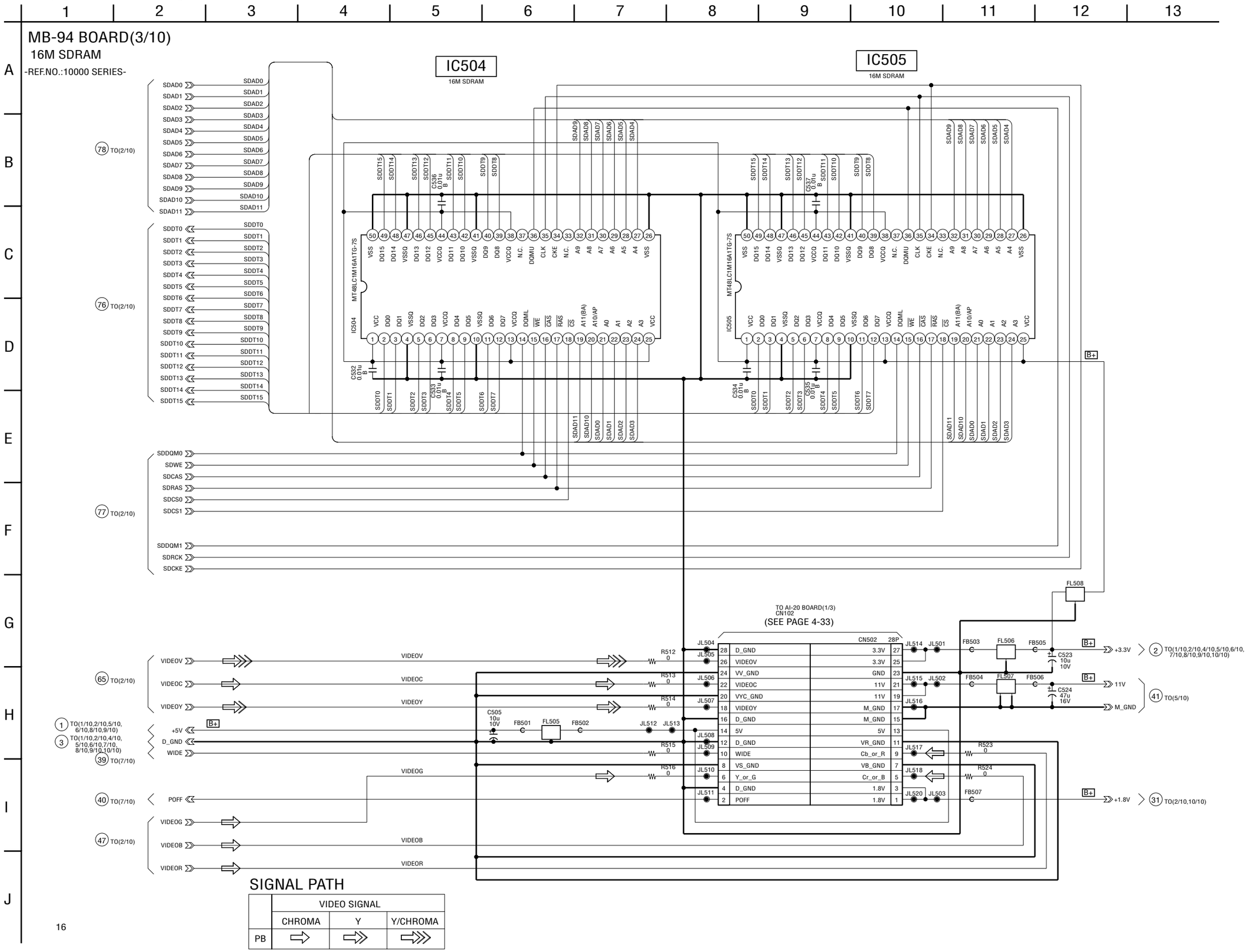
MB-94 BOARD (2/10)



AV DECODER
MB-94 (2/10)

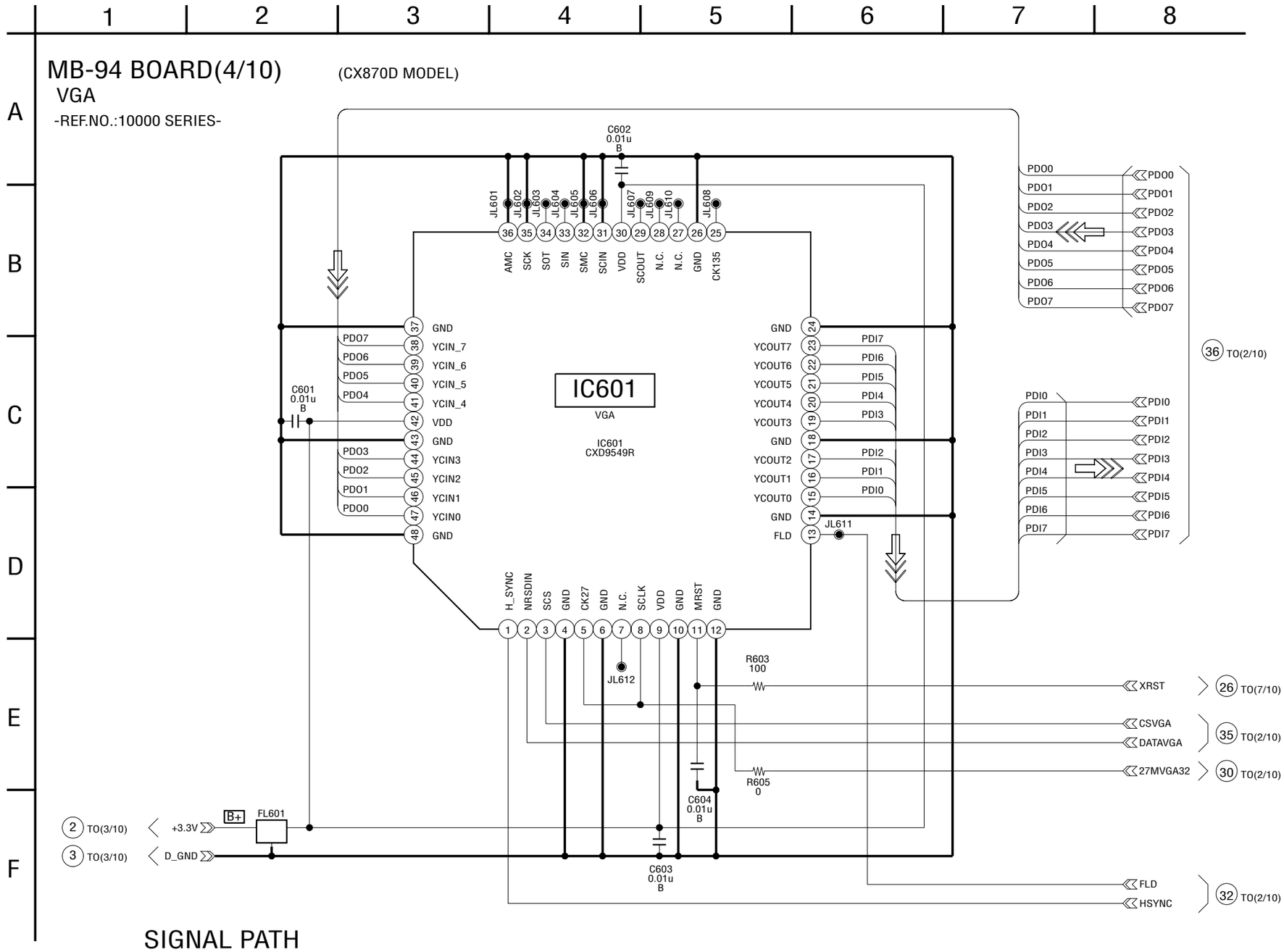
For Schematic Diagram

• Refer to page 4-11 for printed wiring board.



16

For Schematic Diagram
• Refer to page 4-11 for printed wiring board.

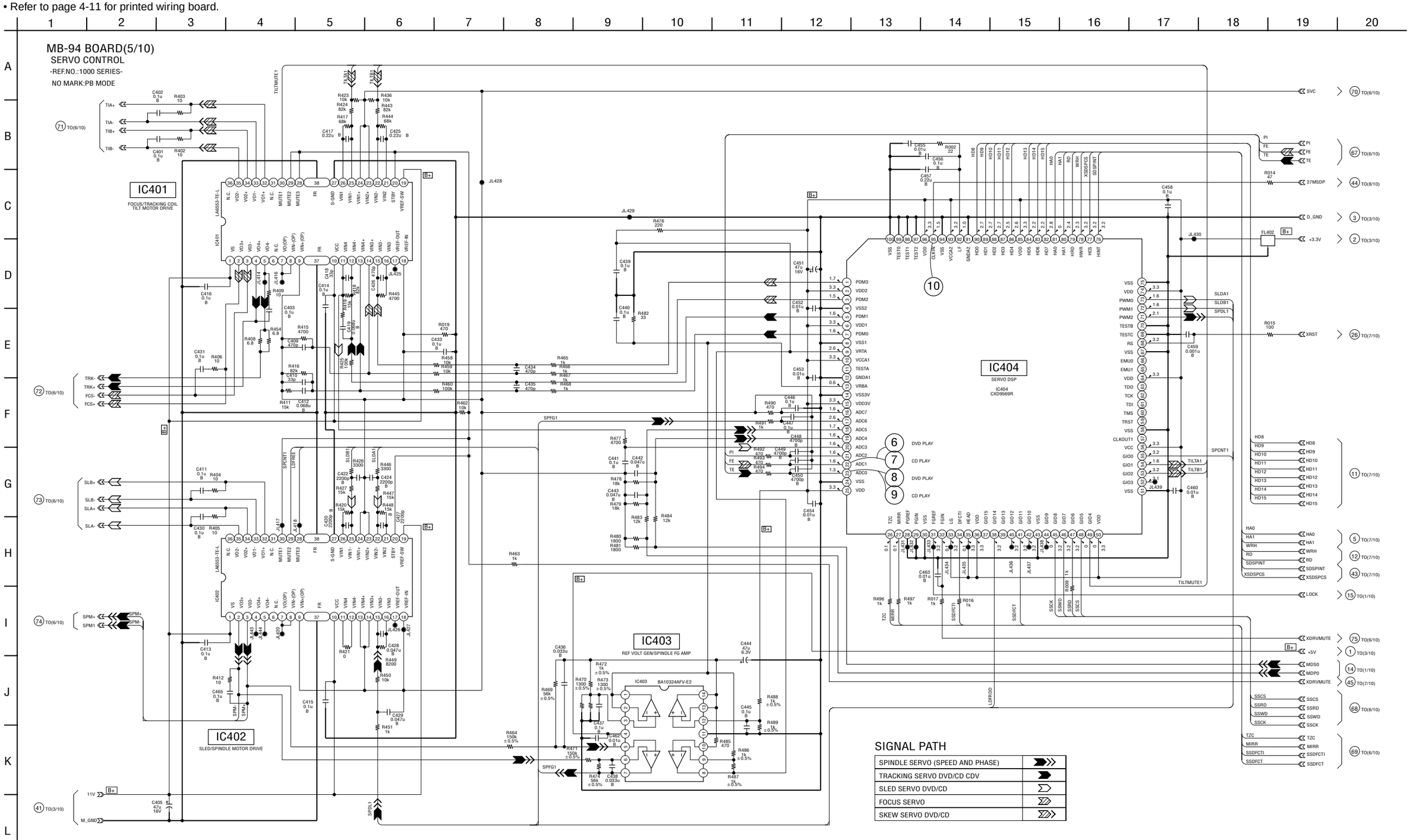


SIGNAL PATH

	VIDEO SIGNAL
	Y/CHROMA
PB	⇨

For Schematic Diagram

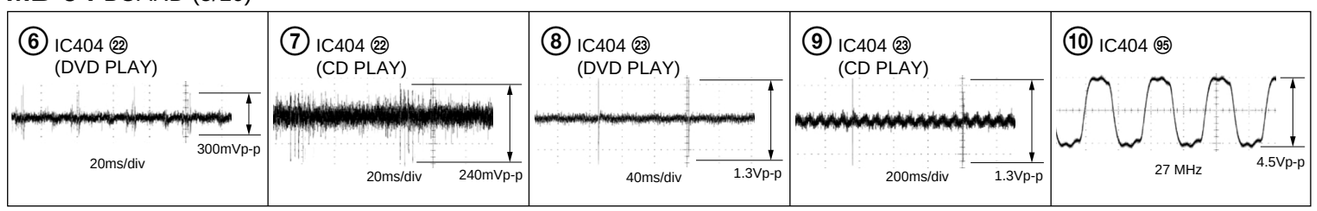
• Refer to page 4-11 for printed wiring board.



SIGNAL PATH

SPINDLE SERVO (SPEED AND PHASE)	
TRACKING SERVO DVD/CD CDV	
SLED SERVO DVD/CD	
FOCUS SERVO	
SKEW SERVO DVD/CD	

MB-94 BOARD (5/10)



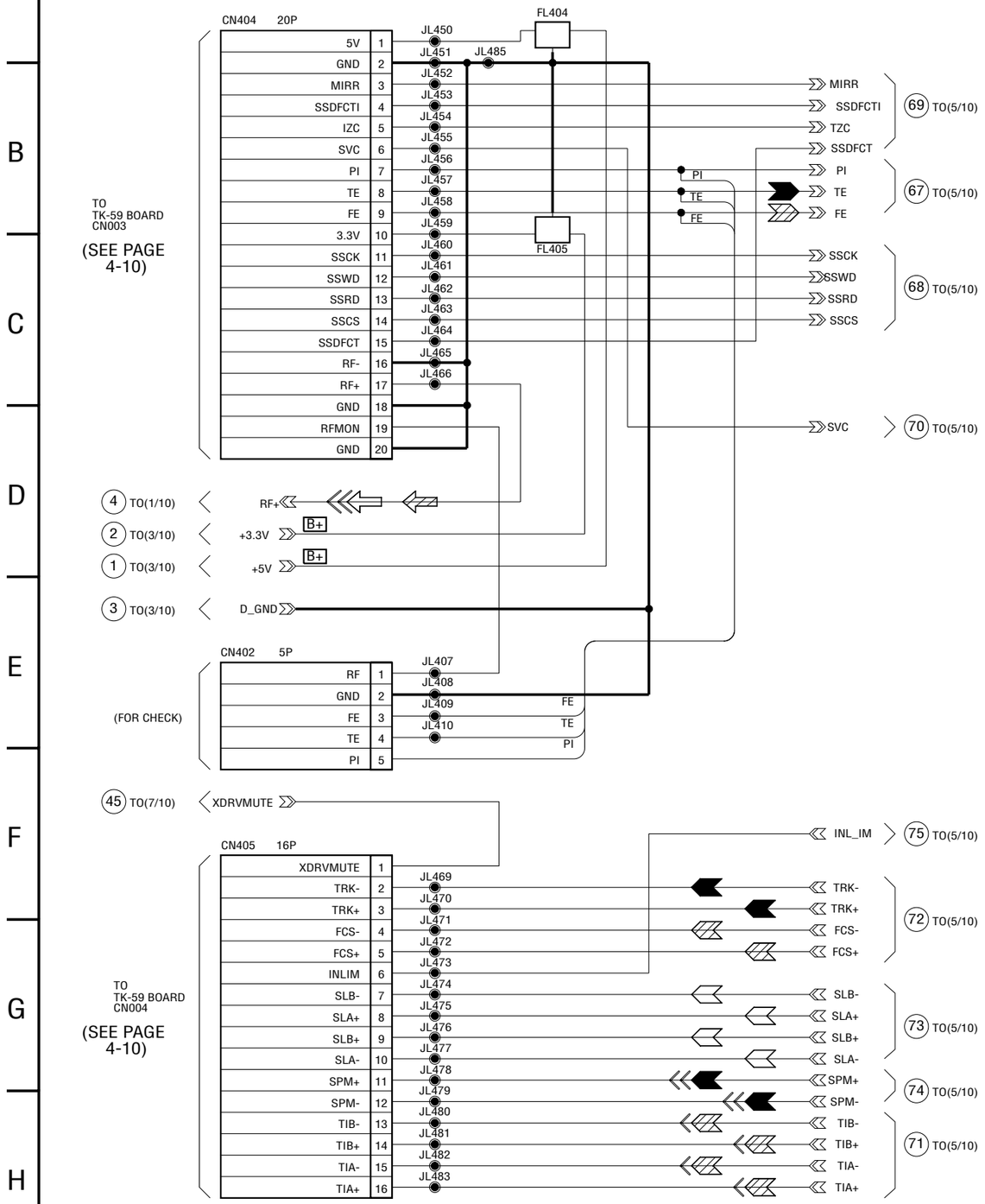
SERVO CONTROL
MB-94 (5/10)

For Schematic Diagram
• Refer to page 4-11 for printed wiring board.

MB-94 BOARD(6/10)

CONNECTOR

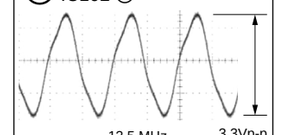
-REF.NO.:10000 SERIES-



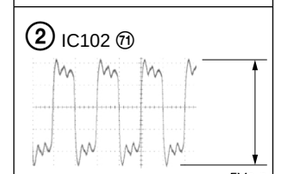
16

MB-94 BOARD (7/10)

① IC102 ㊹



② IC102 ㉛



SIGNAL PATH

	VIDEO SIGNAL	AUDIO SIGNAL
	Y/CHROMA	
PB	⇨	⇨

SPINDLE SERVO (SPEED AND PHASE)	⇨
TRACKING SERVO DVD/CD CDV	⇨
SLED SERVO DVD/CD	⇨
FOCUS SERVO	⇨
SKEW SERVO DVD/CD	⇨

For Schematic Diagram

• Refer to page 4-11 for printed wiring board.

MB-94 BOARD(7/10)

SYSTEM CONTROL

-REF.NO.:10000 SERIES-

NO MARK:PB MODE

IC101 BR9040F-D-E2 EEPROM

IC102 MB91108PFV-G-BND SYSTEM CONTROL

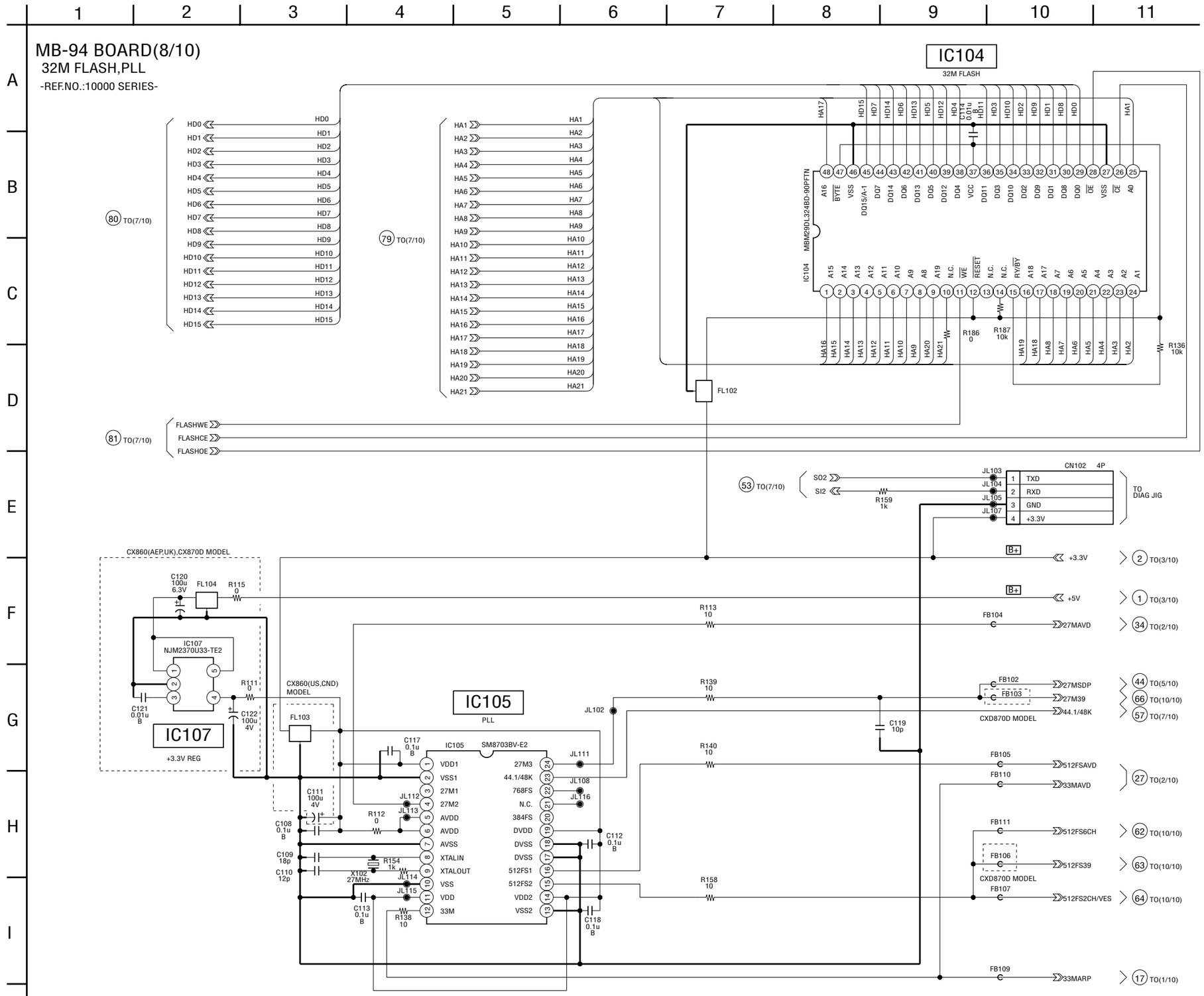
IC103 PST9126NL RESET

AEP/UK MODEL

R126 3300(CX860 MODEL) 2200(CX870D MODEL)

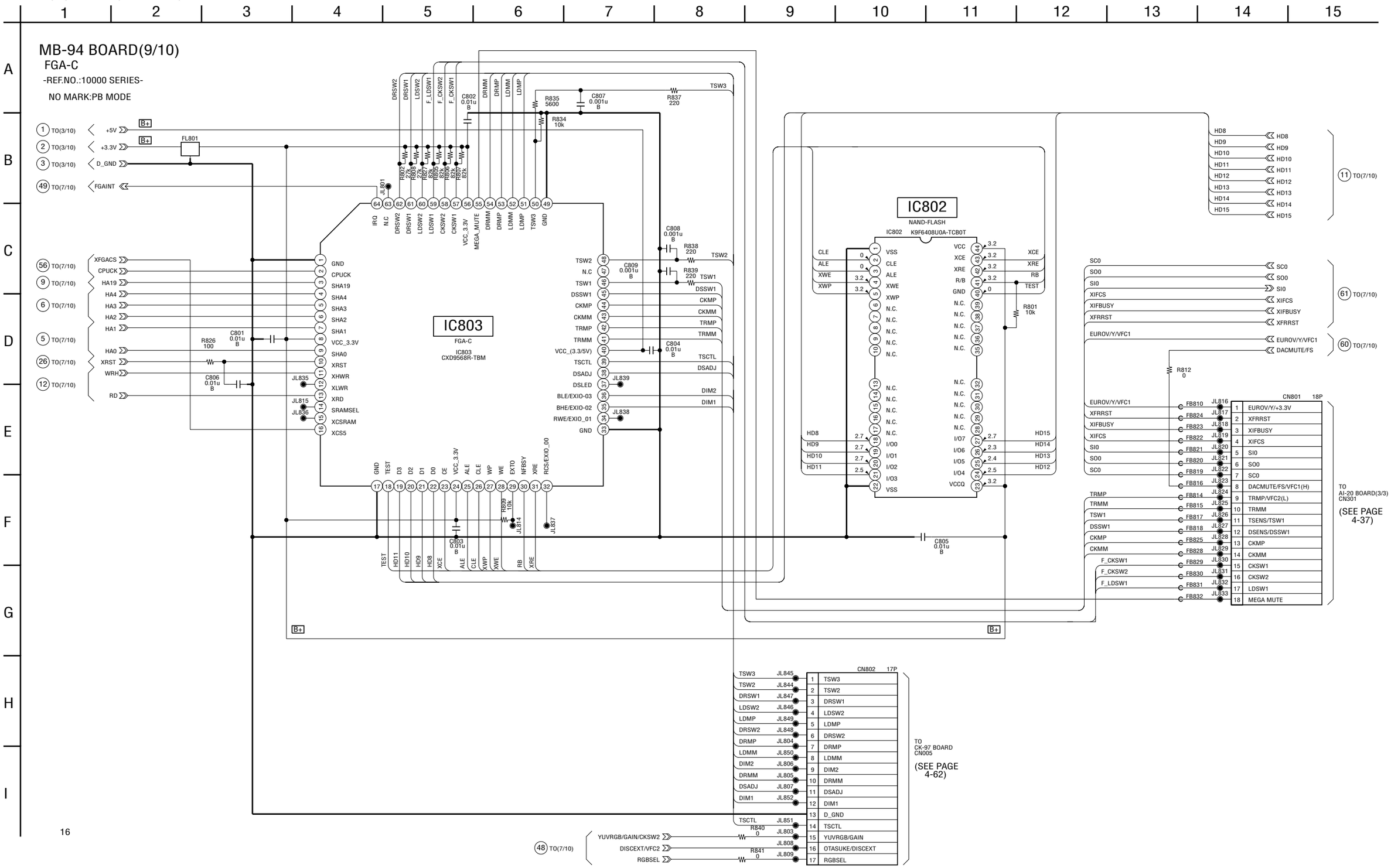
For Schematic Diagram

• Refer to page 4-11 for printed wiring board.



For Schematic Diagram

• Refer to page 4-11 for printed wiring board.



For Schematic Diagram

• Refer to page 4-11 for printed wiring board.

MB-94 BOARD(10/10)

AUDIO

-REF.NO.:10000 SERIES-

NO MARK:PB MODE

CX870D MODEL

CX860 MODEL

IC701

DSP

IC701
CXD1939R

MB-94 BOARD (10/10)

20 IC701 49

22.579 MHz

4.1Vp-p

21 IC701 22

27 MHz

4.7Vp-p

TO AI-20 BOARD(2/3)
CN201
(SEE PAGE 4-35)

SIGNAL PATH

	AUDIO SIGNAL
PB	⇨

For Schematic Diagram

• Refer to page 4-39 for printed wiring board.

AI-20 BOARD(1/3)

VIDEO

-REF.NO.:3000 SERIES-

NO MARK:PB MODE

IC103

VIDEO BUFFER

IC103 LA7109-TLM

IC101

1.8V REG

IC101 PQ018EZ01ZP

IC102

-5V REG

IC102 L79M05T-FA-TL

CN102 28P

CN104 15P

CN103 15P

CN101 15P

TO MB-94 BOARD(3/10) CN502 (SEE PAGE 4-18)

TO CV-34 BOARD CN501 (SEE PAGE 4-57)

TO ER-12 BOARD CN901 (SEE PAGE 4-53)

TO POWER BLOCK (MPW1241:US,CND MODEL) (MPW1141:AEP,UK MODEL) CN101 (SEE PAGE 4-82)

AEP,UK MODEL

SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
PB	⇨	⇨	⇨

AI-20 BOARD (1/3)

① IC103 ㉟ — 2.8Vp-p, H

② IC103 ㉝ — 1.9Vp-p, H

③ IC103 ㉛ — 2.2Vp-p, H

④ IC103 ㉕ — 2.2Vp-p, H

⑤ IC103 ㉓ — 1.5Vp-p, H

⑥ IC103 ㉑ — 1.5Vp-p, H

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

For Schematic Diagram

• Refer to page 4-39 for printed wiring board.

AI-20 BOARD(2/3)
2.6CH AU10
-REF.NO.:3000 SERIES-
NO MARK:PB MODE

The mount table of the parts with asterisk(*) is shown on page 4-83

IC203 VES
IC204 2CH-DAC
IC205 LFE-DAC
IC206 +8V REG
IC207 +5V REG
IC208 FL/FR
IC209 SL/SR
IC210 C/SW.SW
IC202 6CH DAC

TO MB-94 BOARD(10/10) CN702
(SEE PAGE 4-32)

TO CH-98 BOARD CN401 (SEE PAGE 4-49)
TO CH-98 BOARD CN402 (SEE PAGE 4-49)
AEP,UK MODEL
TO ER-12 BOARD CN902 (SEE PAGE 4-53)

SIGNAL PATH

	AUDIO SIGNAL
REC	
PB	⇨

AI-20 BOARD (2/3)

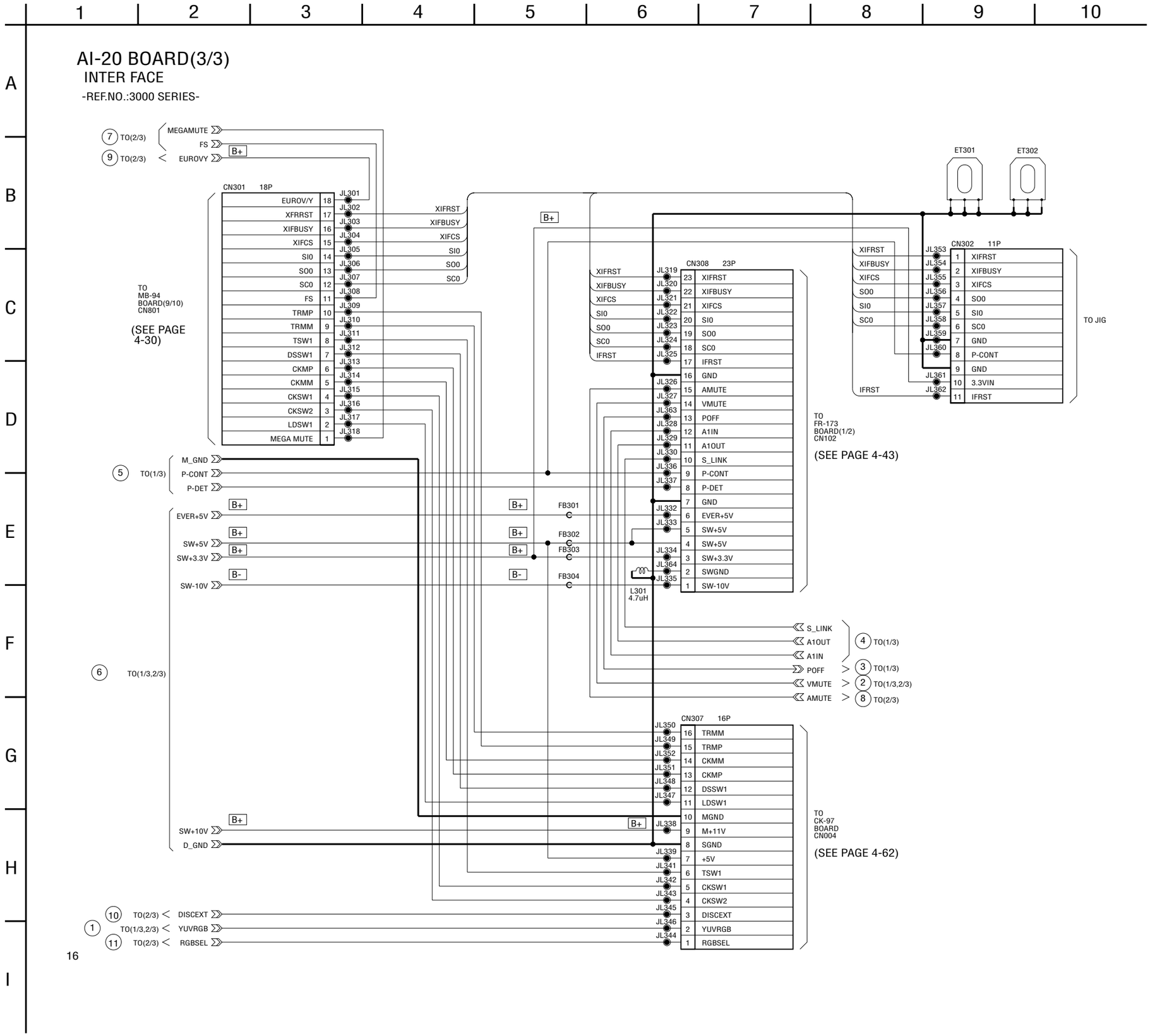
⑦ IC204 ⑥

22.579 MHz

4.5Vp-p

For Schematic Diagram

• Refer to page 4-39 for printed wiring board.



For Schematic Diagram

• Refer to page 4-41 for printed wiring board.

FR-173 BOARD(1/2)
IF COM
-REF.NO.:4000 SERIES-
NO MARK:PB MODE

LE-30 BOARD
DOLBY LED
-REF.NO.:2000 SERIES-

IC102 AND GATE

IC103 S/P CONV

IC101 REMOTE SENSOR

IC104 S-LINE I/F

IC105 RESET

IC106 IF COM
IC106 M38B57M6-159FP

TO FL-115 BOARD CN403 (SEE PAGE 4-77)

TO AI-20 BOARD(3/3) CN308 (SEE PAGE 4-38)

FR-173 BOARD

① IC106 ⑮

4.0 MHz 4.5Vp-p

For Schematic Diagram

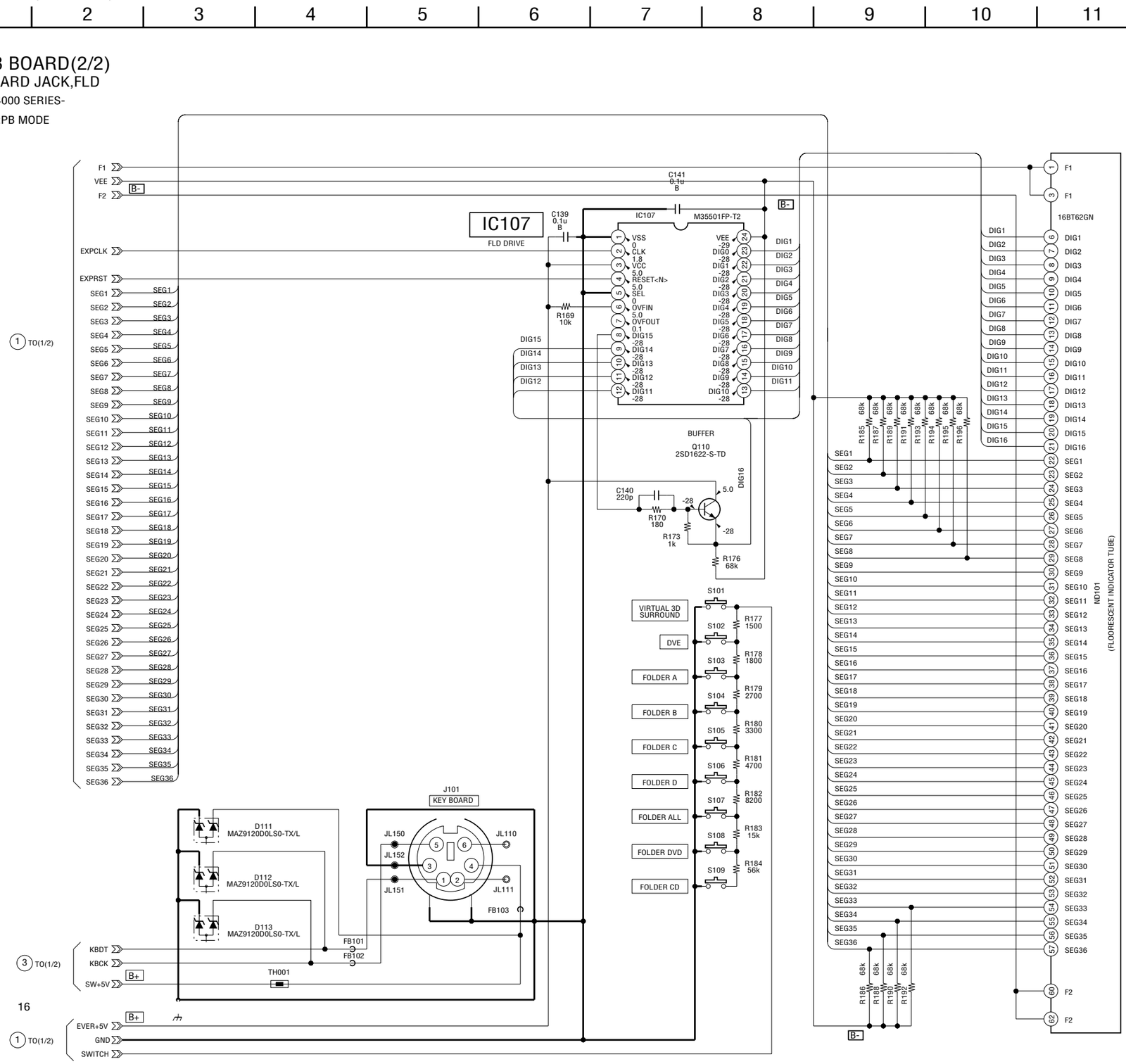
• Refer to page 4-41 for printed wiring board.

FR-173 BOARD(2/2)

KEY BOARD JACK,FLD

-REF.NO.:4000 SERIES-

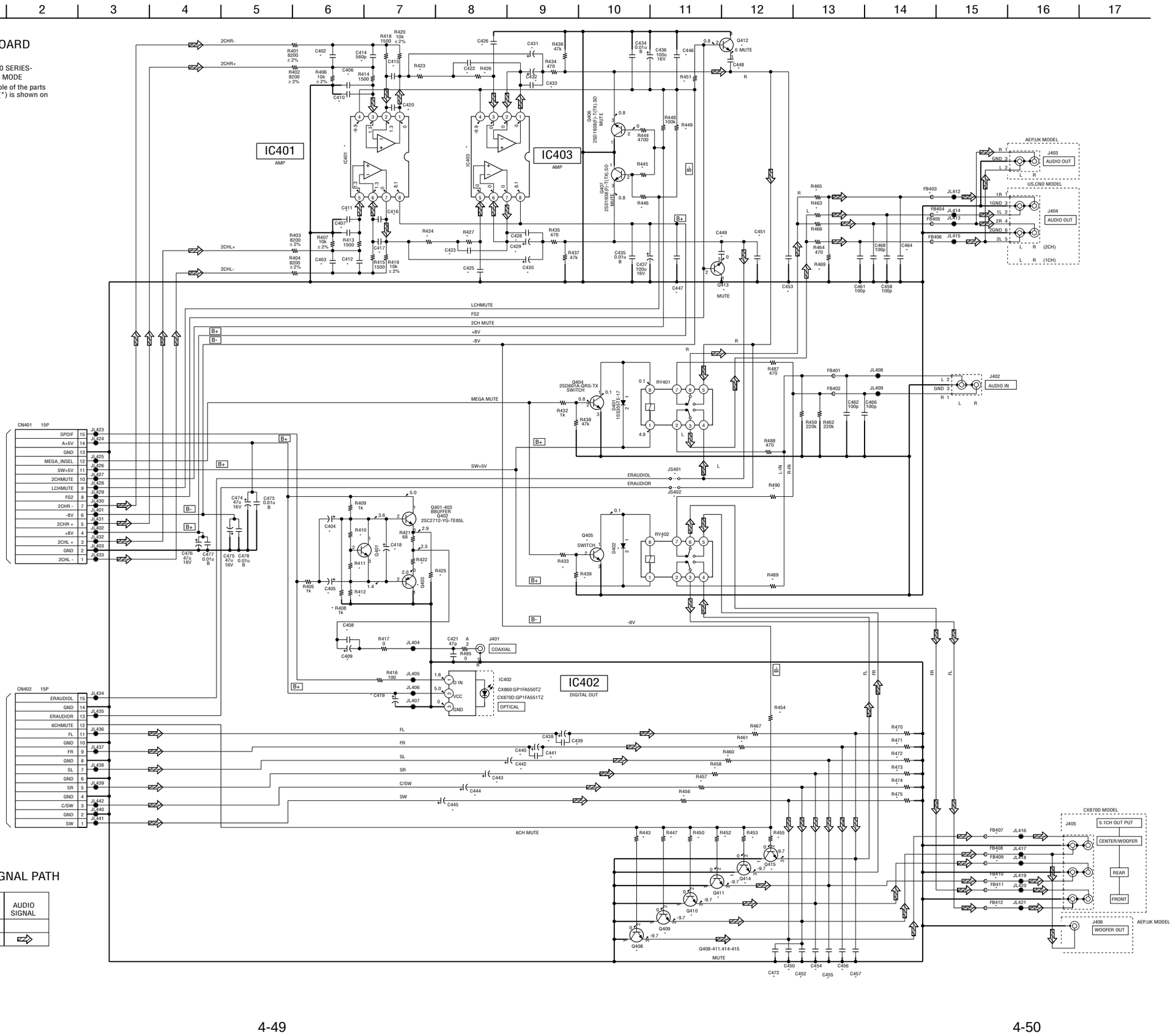
NO MARK:PB MODE



CH-98 BOARD
AUDIO

-REF.NO.:1000 SERIES-
NO MARK:PB MODE

The mount table of the parts with asterisk (*) is shown on Page 4-84.



SIGNAL PATH

	AUDIO SIGNAL
PB	⇨

ER-12 BOARD(AEP,UK MODEL)

EURO AV

-REF.NO.:1000 SERIES-

NO MARK:PB MODE

IC901

IC902 R/C SELECTER

IC903 Y/V SELECTER

TO AI-20 BOARD(1/3) CN103 (SEE PAGE 4-34)

TO AI-20 BOARD CN204 (SEE PAGE 4-36)

CNJ901 LINE-2

CNJ902 LINE-1(RGB)-TV

Q912-918 RY DRIVE

SIGNAL PATH

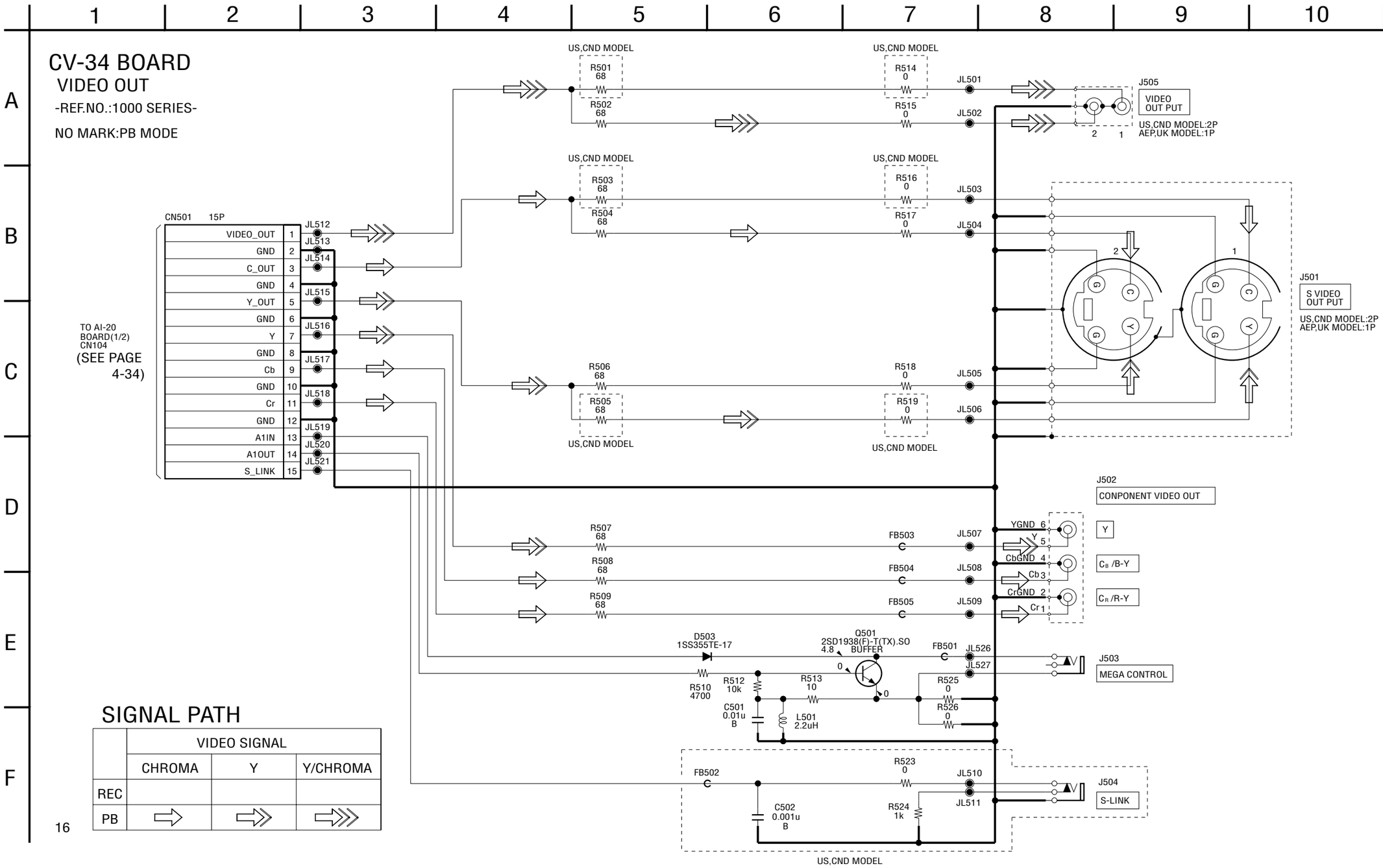
	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
PB	⇨	⇨	⇨

CV-34 BOARD

VIDEO OUT

-REF.NO.:1000 SERIES-

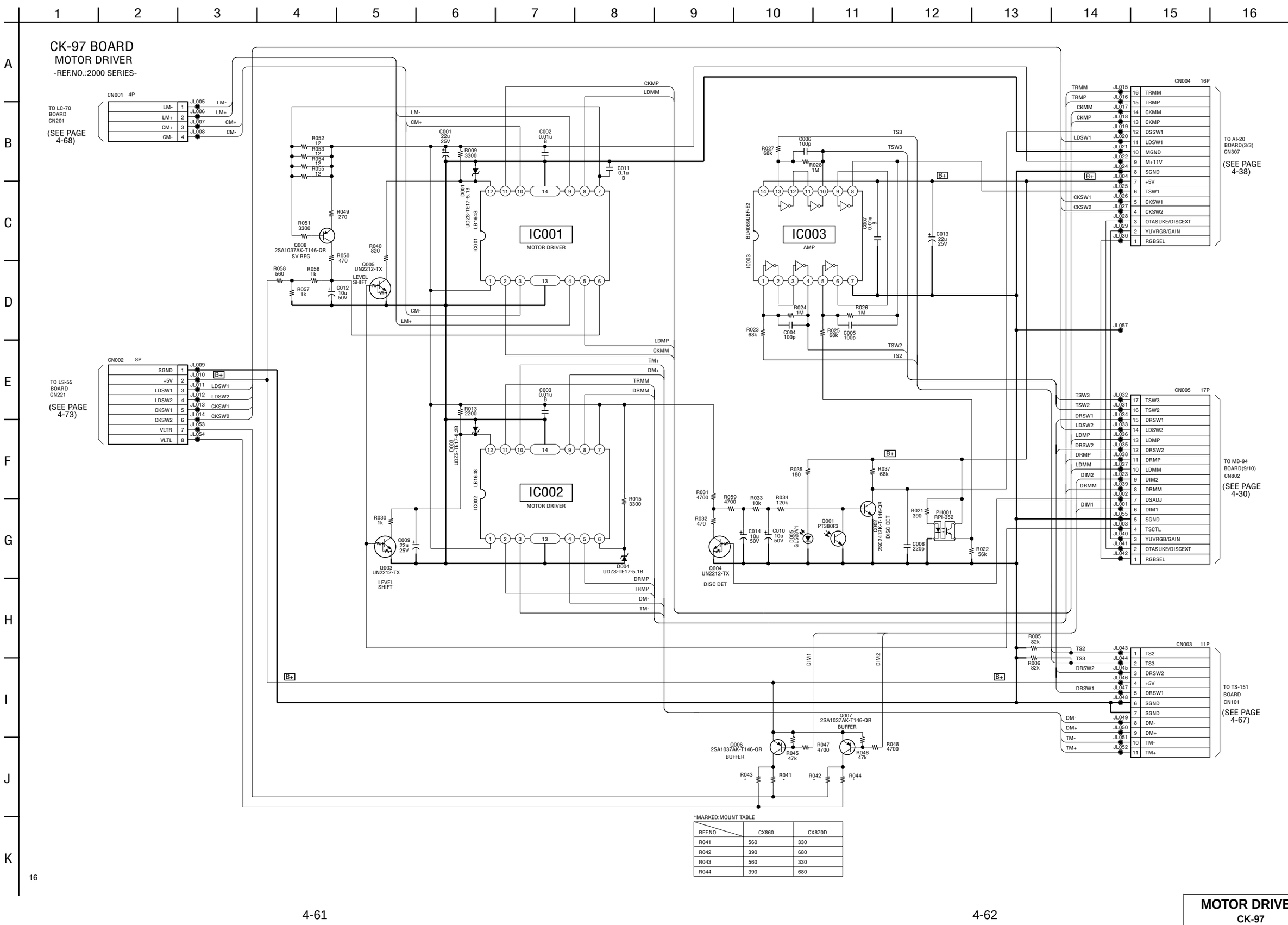
NO MARK:PB MODE



SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			
PB	⇨	⇨	⇨

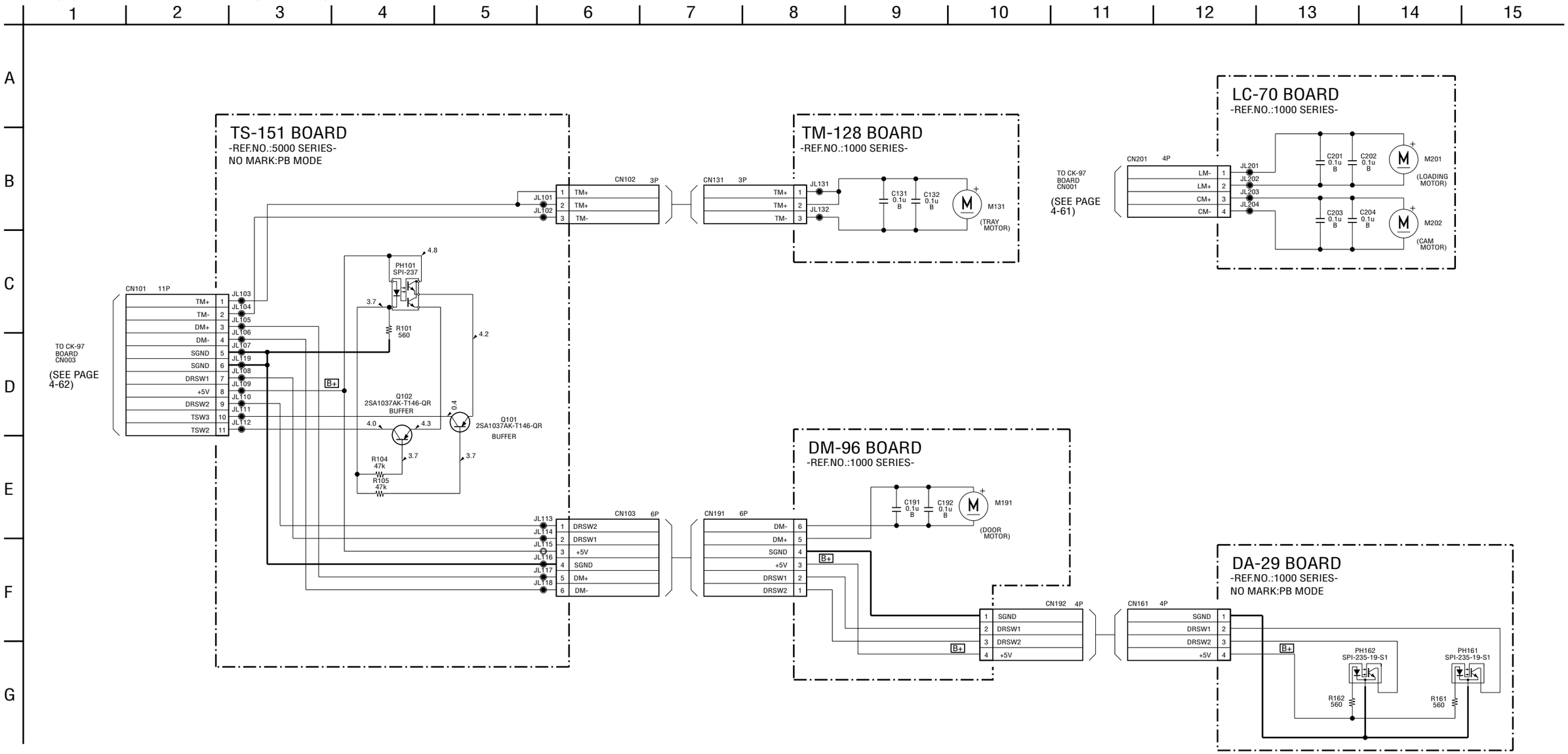
CK-97 BOARD
MOTOR DRIVER
-REF.NO.:2000 SERIES-



*MARKED:MOUNT TABLE

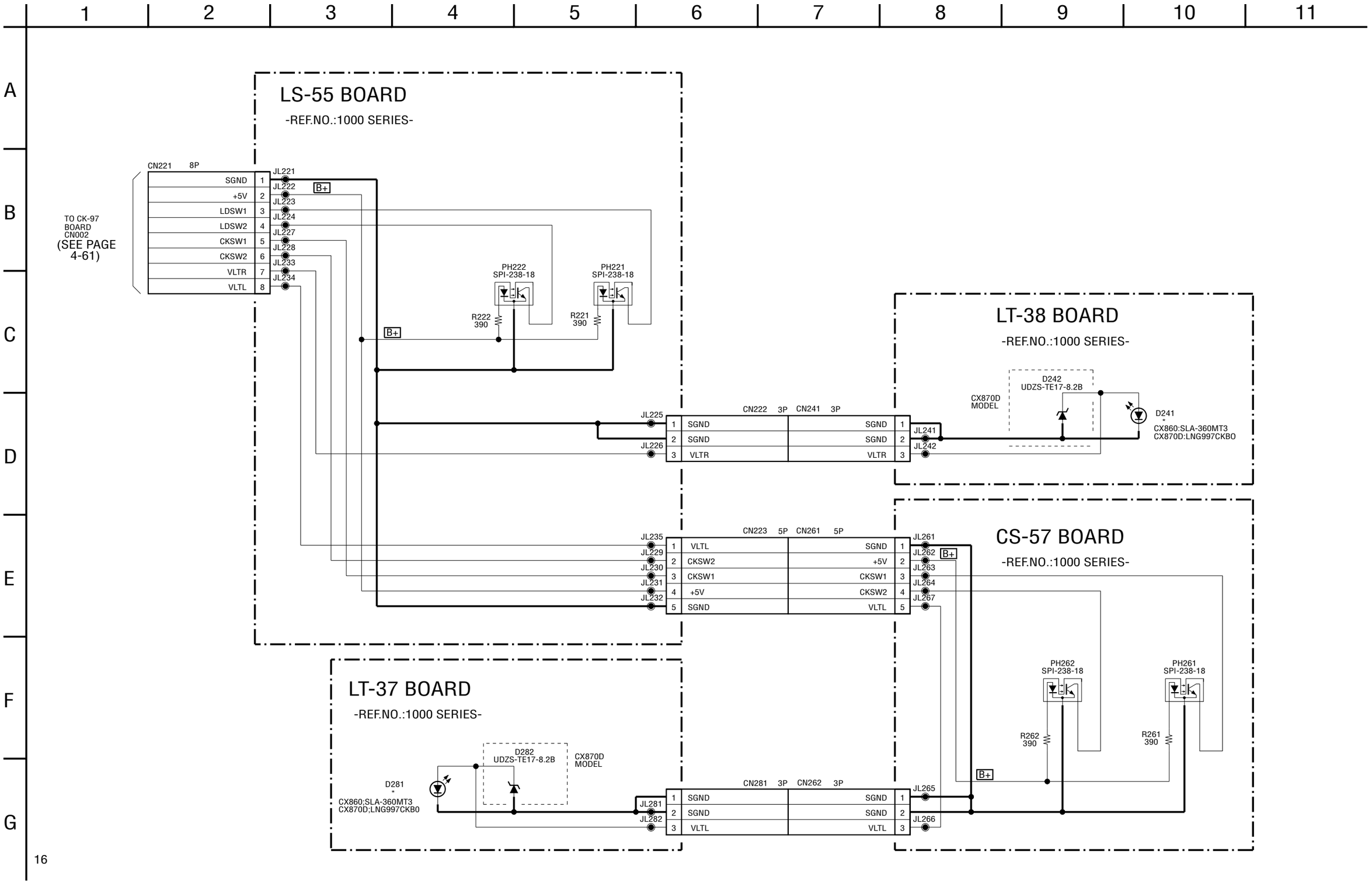
REF.NO	CX860	CX870D
R041	560	330
R042	390	680
R043	560	330
R044	390	680

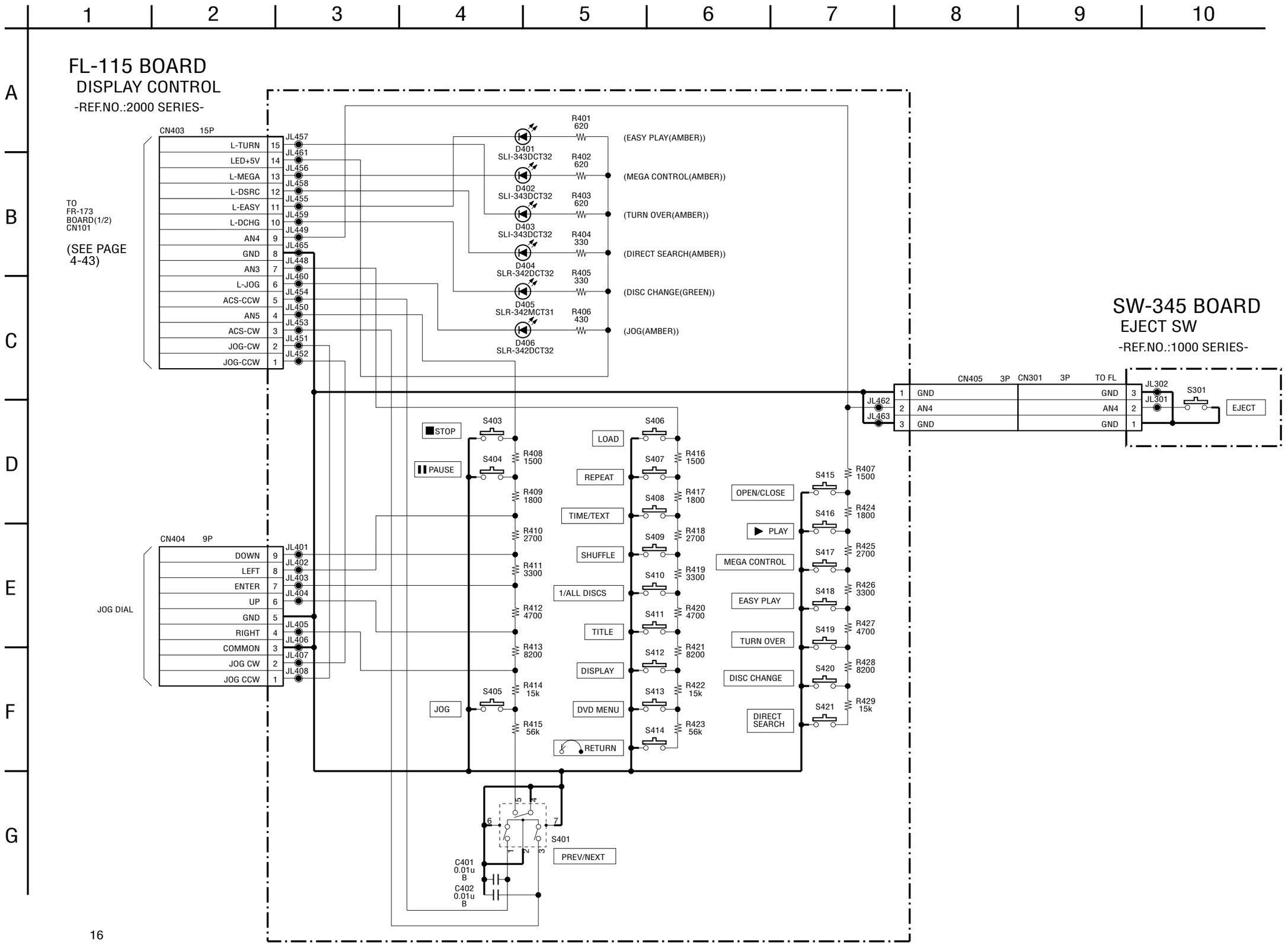
For Schematic Diagram
• Refer to page 4-63 for TS-151, DM-96 printed wiring boards.
• Refer to page 4-65 for TM-128, DA-29, LC-70 printed wiring boards.



For Schematic Diagram

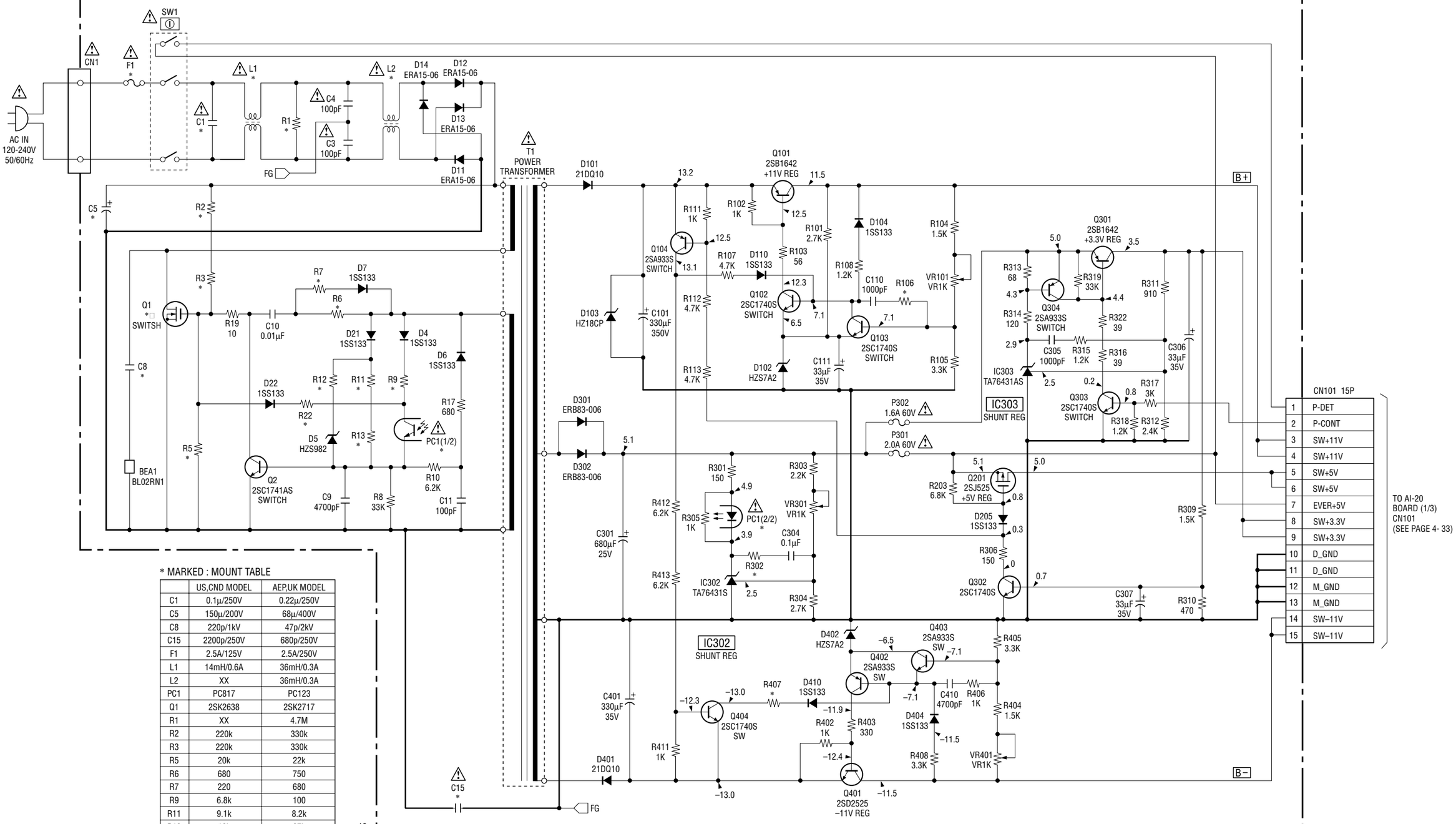
• Refer to page 4-69 for LS-55 printed wiring board.




1 2 3 4 5 6 7 8 9 10
A B C D E F G
FL-115 BOARD
DISPLAY CONTROL
-REF.NO.:2000 SERIES-
TO FR-173 BOARD(1/2) CN101
(SEE PAGE 4-43)
CN403 15P
L-TURN 15 JL457
LED+5V 14 JL461
L-MEGA 13 JL456
L-DSRC 12 JL458
L-EASY 11 JL455
L-DCHG 10 JL459
AN4 9 JL449
GND 8 JL465
AN3 7 JL448
L-JOG 6 JL460
ACS-CCW 5 JL454
AN5 4 JL450
ACS-CW 3 JL453
JOG-CW 2 JL451
JOG-CCW 1 JL452
R401 620
D401 SLI-343DCT32
(EASY PLAY(AMBER))
R402 620
D402 SLI-343DCT32
(MEGA CONTROL(AMBER))
R403 620
D403 SLI-343DCT32
(TURN OVER(AMBER))
R404 330
D404 SLR-342DCT32
(DIRECT SEARCH(AMBER))
R405 330
D405 SLR-342MCT31
(DISC CHANGE(GREEN))
R406 430
D406 SLR-342DCT32
(JOG(AMBER))
SW-345 BOARD
EJECT SW
-REF.NO.:1000 SERIES-
CN405 3P CN301 3P TO FL
JL462 1 GND GND 3 JL302
JL463 2 AN4 AN4 2 JL301
3 GND GND 1
S301
EJECT
STOP S403
PAUSE S404
R408 1500
R409 1800
R410 2700
R411 3300
R412 4700
R413 8200
R414 15k
R415 56k
JOG S405
LOAD S406
REPEAT S407
TIME/TEXT S408
SHUFFLE S409
1/ALL DISCS S410
TITLE S411
DISPLAY S412
DVD MENU S413
RETURN S414
R416 1500
R417 1800
R418 2700
R419 3300
R420 4700
R421 8200
R422 15k
R423 56k
OPEN/CLOSE S415
PLAY S416
MEGA CONTROL S417
EASY PLAY S418
TURN OVER S419
DISC CHANGE S420
DIRECT SEARCH S421
R407 1500
R424 1800
R425 2700
R426 3300
R427 4700
R428 8200
R429 15k
CN404 9P
JOG DIAL
DOWN 9 JL401
LEFT 8 JL402
ENTER 7 JL403
UP 6 JL404
GND 5 JL405
RIGHT 4 JL406
COMMON 3 JL407
JOG CW 2 JL408
JOG CCW 1
S401
PREV/NEXT
C401 0.01u B
C402 0.01u B

16

POWER BLOCK (MPW1241) (US,CND MODEL)
(MPW1141) (AEP,UK MODEL)
-REF NO 6000 SERIES-



* MARKED : MOUNT TABLE

	US,CND MODEL	AEP,UK MODEL
C1	0.1µ/250V	0.22µ/250V
C5	150µ/200V	68µ/400V
C8	220p/1kV	47p/2kV
C15	2200p/250V	680p/250V
F1	2.5A/125V	2.5A/250V
L1	14mH/0.6A	36mH/0.3A
L2	XX	36mH/0.3A
PC1	PC817	PC123
Q1	2SK2638	2SK2717
R1	XX	4.7M
R2	220k	330k
R3	220k	330k
R5	20k	22k
R6	680	750
R7	220	680
R9	6.8k	100
R11	9.1k	8.2k
R12	18k	27k
R13	1.5k	750
R22	470	6.2k
R106	2k	1k
R302	15k	7.5k
R407	4.7k	3k

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

*MARKED:MOUNT TABLE(AI-20BOARD(2/3))

REF.NO	CX860(US,CND)	CX860 (AEP,UK)	CX870D
C203		XX	22u 50V
C208		XX	0.22u 16V B
C209		XX	0.001u 50V B
C210		XX	22u 50V
C211		XX	0.22u 16V B
C212		220u 16V	1000u 10V
C213	XX	0.47u 16V B	
C214		0.01u 50V B	XX
C215		0.01u 50V B	XX
C218		0.01u 50V B	XX
C219	XX	0.01u 50V B	XX
C220		47u 16V	47u 25V
C221	XX	10u 50V	XX
C222		47u 16V	47u 63V
C223		XX	0.1u 63V
C226		47u 16V	47u 63V
C229		XX	0.1u 63V
C230		0.1u 25V B	XX
C231		XX	220u 63V
C232		1u 50V	4.7u 63V
C235		1u 50V	10u 63V
C236		XX	0.1u 63V
C237		100u 10V	47u 63V
C238		0.01u 50V B	XX
C239		0.01u 50V B	XX
C240		XX	3300p 50V B
C241		XX	3300p 50V B
C244		100u 10V	22u 63V
C245		XX	3300p 50V B
C246		XX	3300p 50V B
C249		XX	47u 63V
C250		XX	0.01u 50V B
C251		XX	0.01u 50V B
C252	XX	0.01u 50V B	
C253		XX	220p 50V
C254		XX	220p 50V
C255		XX	150p 50V CH
C256		XX	150p 50V CH
C257		XX	150p 50V
C258		XX	470p 50V CH
C259		XX	820p 50V
C260		XX	1500p 50V CH
C262	XX	0.47u 16V B	
C263		XX	820p 50V
C264		XX	1500p 50V CH
C265		XX	0.001u 50V
C266		XX	220p 50V
C267		XX	150p 50V CH
C268		XX	470p 50V CH
C270		XX	220p 50V
C271		XX	0.01u 50V B
C272		XX	150p 50V CH
C273		XX	0.01u 50V B
C274		XX	150p 50V
C275	XX	0.01u 50V B	

REF.NO	CX860(US,CND)	CX860 (AEP,UK)	CX870D
C276		XX	0.1u 63V
C277		XX	22u 50V
C278		XX	0.22u 25V B
C279		0.01u 50V B	XX
C280		0.01u 50V B	XX
C283		22u 50V	100u 50V
C285	XX	470p 50V CH	XX
C286	XX	470p 50V CH	XX
D201	XX	DAN202K-T-	
D202	XX	1SS355TE-1	XX
D203		XX	DAN202K-T-
IC202		XX	CXD9543Q
IC203		CXD9545Q	XX
IC205	XX	LC78817M-T	XX
IC208		XX	BA15532F-E
IC209		XX	BA4558F-E2
IC210	XX	BA4558F-E2	
Q201		XX	UN2213-TX
Q202	XX	DTC124TKA-	
Q203	XX	2SB709A-QR	
Q208	XX	UN2113-TX	
Q209	XX	DTC124TKA-	
Q210	XX	2SB709A-QR	
R208		XX	0
R221		XX	10
R223		XX	10K
R225		XX	0
R228		XX	10
R230		XX	100
R231		XX	1K
R232		XX	1K
R234		0	XX
R235		XX	10K
R246	XX	10K	
R249	XX	10K	
R255		XX	1200
R256		XX	1200
R257		XX	1200
R258		XX	1200
R259	XX	0	1200
R260	XX	0	1200
R261		XX	0
R262	XX	47K	
R263		XX	3900
R264		XX	3900
R265		XX	3900
R266		XX	3900
R267	XX	3300	1200
R268	XX	3300	1200
R269		XX	1K
R270		XX	1K
R271		XX	3300
R272		XX	3300
R273		XX	3300
R274		XX	3300
R276		XX	3900
R277		XX	12K
R278	XX	0	12K
R279		XX	3900
R280		XX	12K
R281	XX	12K	
R282		XX	1800
R283		XX	1800
R284	XX	0	
R285		XX	1800
R286		XX	1800
R287		XX	1800
R288		XX	1800
R289	XX	0	1800
R290	XX	0	
R291		XX	1800
R292		XX	3900
R293		XX	1800
R294		XX	12K
R295	XX	0	1800
R296	XX	0	12K
R298		XX	3900
R299		XX	12K
R300	XX	12K	
R306		XX	10K
R307		0	XX
R310	0	22	
R315	XX	4700	
R316	XX	10K	
R317	XX	47K	
R318	XX	10K	
R319	XX	470	

*MARKED:MOUNT TABLE(CH-98BOARD)

REF.NO	CX860(US,CND)	CX860 (AEP,UK)	CX870D
C402		560p 50V CH	XX
C403		560p 50V CH	XX
C404		10u 50V	XX
C405		XX	47u 63V
C406		XX	150p 50V
C407		XX	150p 50V
C408		XX	0.1u 63V
C409		470u 6.3V	47u 63V
C410		150p 50V CH	XX
C411		150p 50V CH	XX
C412		XX	560p 50V
C414		XX	560p 50V
C415		XX	150p 50V
C416		150p 50V CH	XX
C417		XX	150p 50V
C418		XX	330u 10V
C419		10u 50V	47u 63V
C420		150p 50V CH	XX
C422		XX	1200p 50V
C423		XX	1200p 50V
C425		XX	470p 50V
C426		XX	470p 50V
C428		XX	0.1u 63V
C429		XX	47u 50V
C430		47u 16V	XX
C431		47u 16V	XX
C432		XX	47u 50V
C433		XX	0.1u 63V
C438		XX	47u 16V
C439		XX	0.1u 63V
C440		XX	47u 16V
C441		XX	0.1u 63V
C442		XX	22u 50V
C443		XX	22u 50V
C444		22u 50V	47u 16V
C445		XX	22u 50V
C446		XX	0.1u 63V
C447		XX	0.1u 63V
C448		XX	0.001u 50V
C449		XX	0.001u 50V
C450		XX	220p 50V CH
C451		3300p 50V	2200p 50V
C452		XX	220p 50V
C453		3300p 50V	2200p 50V
C454		XX	3300p 50V B
C455		XX	3300p 50V B
C456		XX	0.001u 50V
C457		XX	0.001u 50V
C458	100p 50V CH	XX	100p 50V CH
C464	100p 50V CH	XX	100p 50V CH
C472	XX	220p 50V CH	XX

REF.NO	CX860(US,CND)	CX860 (AEP,UK)	CX870D
D402		XX	1SS355TE-1 871998861
FB403	○	XX	○
FB404	○	XX	○
FB407		XX	○
FB408	XX	○	○
FB409		XX	○
FB410		XX	○
FB411		XX	○
FB412		XX	○
IC401		BA4558F-E2	BA15532F-E
IC403		XX	OPA2134UA
JS401	XX	○	XX
JS402	XX	○	XX
Q401		XX	2SC2712-YG
Q403		XX	2SA1162-YG
Q405		XX	2SD601A-QR
Q408		XX	2SD1938(F)
Q409	XX	2SD1938(F)	
Q410		XX	2SD1938(F)
Q411		XX	2SD1938(F)
Q412		XX	2SD1938(F)
Q413		XX	2SD1938(F)
Q414		XX	2SD1938(F)
Q415		XX	2SD1938(F)
R408		1K	XX
R410		XX	22K
R411		XX	10K
R412		XX	1K
R422		XX	68
R423		XX	1800
R424		XX	1800
R425		220	XX
R426		XX	1800
R427		XX	1800
R433		XX	1K
R439		XX	47K
R443		XX	3300
R445	4700	XX	
R446	XX	4700	
R447	XX	3300	
R449	XX	100K	
R450		XX	3300
R451		XX	100K
R452		XX	3300
R453		XX	3300
R454	XX	100K	
R455		XX	3300
R456		XX	470
R457	XX	470	
R458		XX	470
R460		XX	470
R461		XX	470
R463	470	XX	470
R465	470	XX	470
R467		XX	470
R469	XX	0	XX
R470		XX	47K
R471		XX	47K
R472		XX	47K
R473		XX	47K
R474	XX	47K	
R475		XX	47K
R489		XX	470
R490		XX	470
RY402		XX	○

*** MARKED: MOUNT TABLE**
AI-20 (2/3), CH-98

SECTION 6
TEST MODE

6-1. GENERAL DESCRIPTION

The Test Mode allows you to make diagnosis and adjustment easily using the remote commander and monitor TV. The instructions, diagnostic results, etc. are given on the on-screen display (OSD).

6-2. STARTING TEST MODE

At the bottom of menu screen, the model name and revision number are displayed. The “T table” that appers on the screen means the turn table.
To execute each function, select the desired menu and press its number on the remote commander.
To exit from the Test Mode, press the POWER button.

```
         Test Mode Menu

0. Syscon Diagnosis
1. Drive Auto Adjustment
2. Drive Manual Operation
3. Mecha Aging
4. Emergency History
5. Version Information
6. Video Level Adjustment
                Exit: Power Key
_
Model    : DPX13xxxx
Revision   : x.xxx
```

6-3. SYSCON DIAGNOSIS

The same contents as board detail check by serial interface can be checked from the remote commander.
On the Test Mode Menu screen, press [0] key on the remote commander, and the following check menu will be displayed.

```
    ### Syscon Diagnosis ###
           Check Menu
0. Quit
1. All
2. Version
3. Peripheral
4. Servo
5. Supply
6. AV Decoder
7. Video
8. Audio
_
```

0. Quit
Quit the Syscon Diagnosis and return to the Test Mode Menu.

1. All
All items continuous check
This menu checks all diagnostic items continuously. Normally, all items are checked successively one after another automatically unless an error is found, but at a certain item that requires judgment through a visual check to the result, the following screen is displayed for the key entry.

```
    ### Syscon Diagnosis ###

         Diag All Check
          No. 2 Version

 2-3. ROM Check Sum
Check Sum = xxxx



Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

For the ROM Check, the check sum calculated by the Syscon is output, and therefore you must compare it with the specified value for confirmation.
Following the message, press [NEXT] key to go to the next item, or [PREV] key to repeat the same check again. To quit the diagnosis and return to the Check Menu screen, press [STOP] or [ENTER] key. If an error occurred, the diagnosis is suspended and the error code is displayed as shown below.

```
    ### Syscon Diagnosis ###




 3-2. EEPROM Check
Error 03: EEPROM Write/Reed N
Address    : 00000001
Write Data : 2492
Read Data  : 2490
Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

Press [STOP] key to quit the diagnosis, or [PREV] key to repeat the same item where an error occurred, or [NEXT] key to continue the check from the item next to faulty item.

Subnemu

Selecting 2 and subsequent items calls the submenu screen of each item.
For example, if “5. Supply” is selected, the following submenu will be displayed.

```
    ### Syscon Diagnosis ###
           Check Menu
          No. 5 Supply
0. Quit
1. All
2. ARP Register Check
3. ARP to RAM Data Bus
4. ARP to RAM Address Bus
5. ARP RAM Check
_
```

0. Quit
Quit the submenu and return to the main menu.

1. All

All submenu items continuous check
This menu checks 2 and subsequent items successively. At the item where visual check is required for judgment or an error occurred, the checking is suspended and the message is output for key entry. Normally, all items are checked successively one after another automatically unless an error is found.
Selecting 2 and subsequent items executes respective menus and outputs the results.
For the contents of each submenu, see “Check Items List”.

General Description of Checking Method

2. Version

(2-2) Revision
ROM revision number is displayed.
Error: Not detected.
The revision number defined in the source file of ROM (IC106) is displayed with four digits.

(2-3) ROM Check Sum
Check sum is calculated.
Error: Not detected.
The data are added of ROM (IC106) and the result is displayed with 4-digit hexadecimal number. Error is not detected. Compare the result with the specified value.

(2-4) Model Type
Model code is displayed.
Error: Not detected.
The model code is displayed with 2-digit hexadecimal number.

	Model Type	
DVP-CX860 (US, CND)	6	0
DVP-CX860 (AEP, UK)	6	3
DVP-CX870D (US, CND)	7	0

(2-5) Region
Region code is displayed.
Error: Not detected.
The region code determined from the model code is displayed.

3. Peripheral

(3-2) EEPROM Check
Data write → read, and accord check
Error 03: EEPROM write/read discord
Before writing, the data are saved, then after checking, they are written to restore the contents of EEPROM.

(3-3) Gate Array Check
Data write → read, and accord check
Error 02: Gate array write/read discord

4. Servo

(4-2) Servo DSP Check
Data write → read, and accord check
Error 12: Read data discord

(4-3) DSP Driver Test
Test signal data → DSP Driver
Error: Not detected.

5. Supply

Caution: Do not conduct this check with a mechanical deck connected.
An access is made to the stream supply and servo control IC (IC302) and external RAM (IC303) using check data. If mechanical deck is connected, the motor and optics could be damaged. This check is also executed by the “All” menu item.

Supplement: How to disconnect mechanical deck
Disconnect flexible flat cables connected to the CN201 and CN202 of MB-86 board. Also, disconnect flat cable from the CN401.

(5-2) ARP Register Check
Data write → read, and accord check
Error 08: ARP register write, and read data discord

(5-3) ARP to RAM Data Bus
Data write → read, and accord check
Error 09: ARP ←→ RAM data bus error
Data 0x0001 to 0x8000 where one bit each is set to 1 are written to the address 0 of RAM (IC303) connected to the ARP (IC302) through the bus, then they are read and checked. In case of discord, written bit pattern and read data are displayed. If data where multiple bits are 1 are read, the bits concerned may touch each other. Further, if data where certain bit is always 1 or 0 regardless of written data, the line could be disconnected or shorted.

(5-4) ARP to RAM Address Bus
Data write → other address read discord check
Error 10: ARP → RAM address bus error
Caution: Address and data display in case of an error is different from the display of other diagnosis (described later).
Before starting the test, all addresses of RAM (IC303) are cleared to 0x0000.
First, 0xA55A is written to the address 0x00000, and the address data are read and checked from addresses 0x00001 to 0x80000 while shifting 1 bit each. Next, the data at that address is cleared, and it is written to the address 0x00001, and read and checked in the same manner. This check is repeated up to the address 0x80000 while shifting the address data by 1 bit each.
If data other than 0 is read at the addresses except written address, an error is given because all addresses were already cleared to 0. In this check, the error display pattern is different from that of other diagnosis; read data, written address, and read address are displayed in this order. However, the message uses same template, and accordingly exchange Address and Data when reading. The following display, for example,

```
    ### Syscon Diagnosis ###



 5-4. ARP to RAM Address Bus
Error 10: ARP - RAM Address B
Address    : 0000A55A
Write Data : 00000000
Read Data  : 00080000
Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

shows the data 0xA55A was read from address 0x00080000 though it was written to the address 0x00000000. This implies that these addresses are in the form of shadow. Also, if the read data is not 0xA55A, another error will be present.

(5-5) ARP RAM Check
Data write → read, and accord check
Error 11: ARP RAM read data discord
The program code data stored in ROM are copied to all areas of RAM (IC303) connected to the ARP (IC302) through the bus, then they are read and checked if they accord. If the detail check was selected initially, the data are written to all areas and read, then the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 11, and the test is suspended.

6. AV Decoder

(6-2) 1930 RAM
Data write → read, and accord check
Error 13: AVD RAM read data discord
The program code data stored in ROM (IC106) are copied to all areas of RAM (IC504, IC505) connected to the AVD (IC502) through the bus, then they are read and checked if they accord. Further, the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 13, and the test is suspended.

(6-3) 1930 SP
ROM → AVD RAM → Video OUT
Error: Not detected.
The data including sub picture streams in ROM (IC106) are transferred to the RAM (IC504, IC505) in AVD (IC502), and output as video signals from the AVD (IC502).
They are output from all video terminals (Composite, Y/C, Component).

7. Video

(7-2) Color Bar
AVD color bar command write → Video OUT
Error: Not detected.
The command is transferred to the AVD, and the color bar signals are output from video terminals.
They are output from all video terminals (Composite, Y/C, Component).

8. Audio

(8-2) ARP → 1930
Error 14 : ARP → 1930 video NG
15 : ARP → 1930 audio NG

(8-3) Test Tone
A pink noise signal is output from the AVD (IC502) through optical coaxial digital terminal and analog audio terminal.
Error: Not detected.
All channels → 2ch Left → 2ch Right are checked in this order.

Check Items List

2) Version
(2-2) Revision
(2-3) ROM Check Sum
(2-4) Model Type
(2-5) Region

3) Peripheral
(3-2) EEPROM Check
(3-3) Gate Array Check

4) Servo
(4-2) Servo DSP Check
(4-3) DSP Driver Test

5) Supply
(5-2) ARP Register Check
(5-3) ARP to RAM Data Bus
(5-4) ARP to RAM Address Bus
(5-5) ARP RAM Check

6) AV Decoder
(6-2) 1930 RAM
(6-3) 1930 SP

7) Video
(7-2) Color Bar

8) Audio
(8-2) ARP → 1930
(8-3) Test Tone

Error Codes List

00: Error not detected
01: RAM write/read data discord
02: Gate array NG
03: EEPROM NG
08: ARP register read data discord
09: ARP ←→ RAM data bus error
10: ARP ←→ RAM address bus error
11: ARP RAM read data discord
12: Servo DSP NG
13: 1930 SDRAM NG
14: ARP → 1930 video NG
15: ARP → 1930 audio NG
16: 1939 UCODE download NG
17: System call error (function not supported)
18: System call error (parameter error)
19: System call error (illegal ID number)
20: System call error (time out)
90: Error occurred
91: User verification NG
92: Diagnosis cancelled

6-4. DRIVE AUTO ADJUSTMENT

On the Test Mode Menu screen, press [1] key on the remote commander, and the drive auto adjustment menu will be displayed.

```
   ## Drive Auto Adjustment ##

         Adjustment Menu

0. ALL
1. DVD-SL
2. CD
3. DVD-DL
4. SACD



                    Exit: RETURN
```

Normally, [0] is selected to adjust DVD (single layer), CD, DVD (dual layer), and SACD in this order. But, individual items can be adjusted for the case where adjustment is suspended due to an error. In this mode, the adjustment can be made easily through the operation following the message displayed on the screen.
The disc used for adjustment must be the one specified for adjustment. However, for SACD disc, use the player with initial data if the disc is not available.

0. ALL

When [0.ALL] is selected, set the three discs at the same time. With the signal read out side of disc facing to the left, set the discs into 1. DVD-DL, 2. CD, 3. DVD-DL starting from number 1 of the T.table in this order. Press [ENTER] . Then, 1. DVD-SL disc, 2. CD disc and 3. DVD-DL disc are adjusted in this order. Discs need not be replaced. If an error is detected, re-start the adjustment from the very beginning. When you want to adjust these discs one disc after another, set the T table number to 1. Each time one disc was adjusted, it is ejected. Replace it with the specified disc following the message. Though the message to confirm whether discs other than SACD disc are adjusted is not displayed, you can finish the adjustment if pressing the [STOP] button. The S curve level, RF level, and jitter value can be confirmed during adjustment, and if OK, press the [ENTER] key and continue adjustment. (If NG, press the [STOP] button) During adjustment of each disc, the measurement for disc type judgment is made. As automatic adjustment does not judge the disc type unlike conventional models, take care not to insert wrong type discs. Also, do not give a shock during adjustment.

1. DVD-SL (single layer)

Select [1], insert DVD single layer disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

DVD Single Layer Disc Adjustment Steps

1. SLED TILT Reset
2. Disc Check Memory SL
3. Wait 500 msec
4. Set Disc Type SL
5. LD ON
6. Spdl Start
7. Wait 1 sec
8. Focus Search ON
9. Focus Search OFF
10. Focus Servo ON 1
11. Auto Track Offset Adjust
12. Tracking ON
13. CLVA ON
14. Wait 1 sec
15. Sled ON
16. Check CLV Lock
17. Auto LFO Adjust
18. Auto Focus Offset Adjust
19. Auto Tilt Position Adjust
20. Auto Focus Gain Adjust
21. Auto Focus Offset Adjust
22. EQ Boost Adjust
23. Auto LFO Adjust
24. Auto Track Gain Adjust
25. All Servo Stop
26. Eep Copy Loop Filter Offset

2. CD

Select [2], insert CD disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

CD Adjustment Steps

1. Sled Tilt Rest
2. Disc Check Memory CD
3. Wait 500 msec
4. Set Disc Type CD
5. LD ON
6. Spdl Start
7. Wait 1 sec
8. Focus Search ON
9. Focus Search OFF
10. Focus Servo ON 1
11. Auto Track Offset Adjust
12. Tracking ON
13. (TC Display Start)
14. CLVA ON
15. Wait 1 sec
16. Jitter Display Start
17. Sled ON
18. Check CLV ON
19. Auto LFO Adjust
20. Auto Focus Offset Adjust
21. Auto Focus Gain Adjust
22. Auto Focus Offset Adjust
23. Eq Boost Adjust
24. Auto LFO Adjust
25. Auto Track Gain Adjust
26. All Servo Stop

3. DVD-DL (dual layer)

Select [3], insert DVD dual layer disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

DVD Dual Layer Disc Adjustment Steps

1. Sled Tilt Reset
2. Disc Check Memory DL
3. Wait 500 msec
4. Set Disc Type DL
5. LD ON
6. Spdl Start
7. Wait 1 sec
   Layer 1 Adjust
8. Focus Servo ON 1
9. Auto Track Offset Adjust
10. Tracking ON
11. Clva ON
12. Wait 1 sec
13. Sled ON
14. Check CLV Lock
15. Auto Loop Filter Offset Adjust
16. Auto Focus Offset Adjust
17. Auto Focus Gain Adjust
18. Auto Focus Offset Adjust
19. Eq Boost Adjust
20. Auto Loop Filter Offset
21. Auto Track Gain Adjust
    Layer 0 Adjust
22. Fj (L1 → L0)
23. Auto Track Offset Adjust L0
24. Tracking ON
25. Clva ON
26. Wait 1 sec
27. Sled ON
28. Check CLV Lock
29. Auto Loop Filter Offset Adjust
30. Auto Focus Offset Adjust
31. Auto Focus Gain Adjust
32. Auto Focus Offset Adjust
33. Eq Boost Adjust
34. Auto Loop Filter Offset
35. Auto Track Gain Adjust
36. All Servo Stop

4. SACD

Select [4], insert SACD disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM. However, if SACD disc is not available, use the player with initial data, skipping the SACD adjustment. In this case, you can finish the adjustment if pressing the [STOP] button.

SACD Adjustment Steps

1. Sled Tilt Reset
2. Set Disc Type CD
3. LD ON
4. Spdl Start
5. Wait 1 sec
6. Focus Servo ON 0
7. Auto track Offset Adjust
8. Tracking ON
9. CLVA ON
10. Wait 1 sec
11. Sled ON
12. Check CLV ON
13. Auto LFO Adjust
14. Auto Focus Offset Adjust
15. Auto Focus Gain Adjust
16. Auto Focus Offset Adjust
17. Eq Boost Adjust
18. Auto LFO Adjust
19. Auto Track Gain Adjust
20. All Servo Stop

6-5. DRIVE MANUAL OPERATION

On the Test Mode Menu screen, select [2], and the manual operation menu will be displayed. When the menu item [2] is selected, the machine starts the mechanical initialization automatically. For the manual operation, each servo on/off control and adjustment can be executed manually. The unique adjustment of the model 300 CHG is the adjustment item “7 & 8. 300 CHG MechaCon Menu 1 and 2”.

```
  ## Drive Manual Operation ##

         Operation Menu
1. Disc type
2. Servo Control
3. Track/Layer Jump
4. Manual Adjustment
5. Auto Adjustment
6. Memory Check
7. 300CHG MechaCon Menu 1
8. 300CHG MechaCon Menu 2
0. Disc Check Memory
                Exit: Return
```

In using the manual operation menu, take care of the following points. These commands do not provide protection, thus requiring correct operation. The sector address or time code field is displayed when a disc is loaded.

1. Set correctly the disc type to be used on the Disc Type screen.
   The disc type must be set after a disc was loaded.
   The set disc type is cleared when the tray is opened.
2. After power ON, if the Drive Manual Operation was selected, first perform “Reset SLED TILT” by opening 1. Disc Type screen.
3. In case of an alarm, immediately press the [STOP] button to stop the servo operation, and turn the power OFF.

Basic operation (controllable from front panel or remote commander)

[POWER]	Power OFF
[STOP]	Servo stop
[OPEN/CLOSE]	Stop+Eject/Loading
[RETURN]	Return to Operation Menu or Test Mode Menu
[NEXT], [PREV]	Transition between sub modes of menu
[1] to [9], [0]	Selection of menu items
Cursor UP/DOWN	Increase/Decrease in manually adjusted value

0. Disc Check Memory

```
          Disc Check



1. SL Disc Check
2. CD Disc Check
3. DL Disc Check



0. Reset SLED TILT
```

On this screen, the mirror time is measured to judge the disc and it is written to the EEPROM. First load DVD SL disc and press [1], next load CD disc and press [2], and finally load DVD DL disc and press [3].
The adjustment must be executed more than once after default data were written. External vibration or shock to the player must not be given. Reference value for DVD is from 10 to 20, and for CD, from 28 to 4F.
Check that the value of CD is larger than that of DVD.
When those values are beyond a range perform this adjustment again.
From this screen, you can go to another mode by pressing [NEXT] or [PREV] key, but you cannot enter this mode from another mode. You can enter this mode from the Operation Menu screen only.

1. Disc Type

```
          Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
                        EMG. 00
```

On this screen, select the disc type. To select the disc type, press the number of the loaded disc. The selected disc type is displayed at the bottom. Selecting [1] automatically selects and displays the disc type. In case of wrong display, retry “Disc Check Memory”. Also, opening the tray causes the set disc type to be cleared. In this case, set the disc type again after loading.
In performing manual operation, the disc type must be set.
Once the disc type has been selected, the sector address or time code display field will appear as shown below. These values are displayed when PLL is locked.

```
          Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
       SA._____ SI.___ EMG. 00
DVD SL 12 cm
```

Display when DVD SL 12cm disc was selected

```
          Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
       TC.___:___:___ EMG. 00
CD   12 cm
```

Display when CD 12cm disc was selected

[0] Reset SLED TILT — Reset the Sled and Tilt to initial position.

[1] Disk Type Check — Judge automatically the loaded disc. As the judged result is displayed at the bottom of screen, make sure that it is correct.
If Disc Check Memory menu has not been executed after EEPROM default setting, the disc type cannot be judged. In this case, return to the initial menu and make a check for three types of discs (SL, DL, CD).

[2] to [9] — Select the loaded disc. The adjusted value is written to the address of selected disc. No further entry is necessary if [1] was selected.

2. Servo Control

```
          Servo Control
1. LD         Off R.Sled FWD
2. SP         Off L.Sled REV
3. Focus      Off U.Tilt Up
4. TRK.       Off D.Tilt Down
5. Sled       Off
6. CLVA       Off
7. FCS. Srch Off



0. Reset SLED TILT
       SA._____ SI.___ EMG. 00
DVD SL 12 cm
```

On this screen, the servo on/off control necessary for replay is executed. Normally, turn on each servo from 1 sequentially and when CLVA is turned on, the usual trace mode becomes active. In the trace mode, DVD sector address or CD time code is displayed. This is not displayed where the spindle is not locked.
The spindle could run overriding the control if the spindle system is faulty or RF is not present. In such a case, do not operate CLVA.

0	Reset SLED TILT	Reset the Sled and Tilt to initial position.
1	LD	Turn ON/OFF the laser.
2	SP	Turn ON/OFF the spindle.
3	Focus	Search the focus and turn on the focus.
4	TRK	Turn ON/OFF the tracking servo.
5	Sled	Turn ON/OFF the sled servo.
6	CLVA	Turn ON/OFF normal servo of spindle servo.
7	FCS. Srch	Apply same voltage as that of focus search to the focus drive to check the focus drive system.
→	Sled FWD	Move the sled outward. Perform this operation with the tracking servo turned off.
←	Sled REV	Move the sled inward. Perform this operation with the tracking servo turned off.
↑	Tilt UP	Move the tilt upward.
↓	Tilt DOWN	Move the tilt downward.

The following menus are normally not used.

3. Track/Layer Jump
4. Manual Adjustment
5. Auto Adjustment

The persons who do not know well about these menus should not use them.

6. Memory Check

```
EEPROM DATA              -- DL --
             CD SACD   SL  L0  L1
Focus Gain    xx xx    xx  xx  xx
TRK. Gain     xx xx    xx  xx  xx
Focus Offset  xx xx    xx  xx  xx
TRK. Offset   xx xx    xx  xx  xx
L. F. Offset  xx xx    xx  xx  xx
Analog FRSW   xx xx    xx  xx  xx
PLL DAC Gain  xx xx    xx  xx  xx
EQ Boost      xx xx    xx  xx  xx
Jitter        xx xx    xx  xx  xx
Mirror Time   xx       xx  xx
_            CLEAR: Default Set
```

This screen displays current servo adjusted data stored in the EEPROM. Though adjusted data can be initialized with the CLEAR key, they cannot be restored after initialization.
So, before clearing, make a note of the adjusted data.
For reference, the drive has been designed so that the gain center value is 20 and offset value is 80. Other values will be in a range of 10 to 80. If extreme value such as 00 or FF is set, adjustment will be faulty. In such a case, check for disc scratch or cable disconnection, then perform adjustment again.

7. 300 CHG MechaCon Menu 1

On this test mode screen, selecting 7 enables the adjustment from the front control panel such as disc loading. The following screen appears.

When 7 is selected in the Drive Manual Operation

```
  ## 300CHG MechaCon Menu 1 ##
ENTER     : Mecha Initial
PLAY      : Disc Load(FRONT)
STOP      : Disc UnLoad(FRONT)
OR/CL     : Door OPEN/CLOSE
UP        : UnChuck(FRONT)
DOWN      : Chuck(FRONT)
RIGHT     : Loading(FRONT)
LEFT      : UnLoading(FRONT)
Jog FOR   : Table R Step Turn
Jog PRV   : Table L Step Turn

RETURN:EXIT
```

ENTER Mecha Initial : Performs initialization of mechanism. Because the mechanical initialization is performed when the machine enters the Drive Manual Operation mode, use this item when an error such as adjustment error occurs.

PLAY Disc Load : Loads the disc from the chucking position of the T. table toward inside the MD.
When the Disc Load is selected, a series of operation starting from Unchucking – Loading – Chucking is performed.

STOP Disc Unload : Moves the disc from inside the MD to the T. table.
When the Disc Unload is selected, a series of operation starting from Unchucking – Unloading – Chucking is performed.

OP/CL Door OPEN/CLOSE : Opens and closes the door.

UP Un-chuck : Un-chucks the MD block.

DOWN Chuck : Chucks the MD block.

RIGHT Loading : Moves the disc from the un-chucked state to the T. table then to the MD block.

LEFT Unloading : Moves the disc from the un-chucked state to the MD block then to the T. table.

Jog FOR Table R step Turn: Moves the T. table to the right in units of slit. The T. table number is incremented in the direction of positive (+) number.

Jog PRV Table L step Turn: Moves the T. table to the left in units of slit. The T. table number is decremented in the direction of negative (-) number.

8. 300 CHG MechaCon Menu 2

On this test mode screen, selecting [8] enables the adjustment from the rear panel such as disc loading. The following screen appears.

When [8] is selected in the Drive Manual Operation

```
  ## 300CHG MechaCon Menu 2 ##
ENTER     : Mecha Initial
PLAY      : Disc Load(REAR)
STOP      : Disc UnLoad(REAR)
OR/CL     : Door OPEN/CLOSE
UP        : UnChuck(REAR)
DOWN      : Chuck(REAR)
RIGHT     : Loading(REAR)
LEFT      : UnLoading(REAR)
DISP      : Mecha Adjust
PAUSE     : TT offset Debug

RETURN:EXIT
```

Insertion and rejection of discs are performed from the rear panel. All operations are the same as those of the 300CHG MechaCon Menu-1 except [DISP] and [PAUSE].

[DISP] Mecha Adjust : When this item is selected, the machine enters the adjustment mode of the disc existence/non-existence sensor. The following screen appears.

[PAUSE] TT offset Debug: When this item is selected, load to the T, table is measured by changing the value of the PWM control to the motor. Never attempt to enter this mode. When this mode is selected, the machine needs to perform the Mecha Initial.

When Mecha Adjust is selected in the 300CHG Mecha Con Menu-2

```
    ## Mecha Adjust Mode ##
RIGHT     : Disc Sensor Adjust
LEFT      : TurnTable Adjust

TurnTable Data  : XX
SensorSensiv    : XX
Sensor Posi RP  : XX
Sensor Posi RM  : XX
Sensor Posi LP  : XX
Sensor Posi LM  : XX

          RETURN:EXIT
```

Turn Table Data : Indicates the center position of the slit. (Width of one slit = 24 pulses). The default value is 12.

Sensor Sensiv : Indicates sensitivity of the disc sensor. The normal value is ranging from 1 to 5.

Sensor Posi RP : These are not the important values.
Sensor Posi RM :
Sensor Posi LP :
Sensor Posi LM : They indicates the position of the disc sensor when the disc sensor monitors the disc when rotating the T. table. Rx indicates the value when the T. table is rotated clockwise and Lx indicates the value when the T. table is rotated counter-clockwise.

[RIGHT] : Enters the sensitivity adjustment mode of the disc sensor.

[LEFT] : Adjusts finely the center position of the slit in units of pulse using the Jog dial.

When Disc Sensor Adjust is selected in the 300CHG Mecha Con Menu-2

```
    ## Sensor Adjust Mode ##
DOWN      : Sensitivity Adjust
RIGHT     : Position Adjust R
LEFT      : Position Adjust L




          RETURN:EXIT
```

[DOWN] : Performs the sensitivity adjustment of the disc sensor by turning the T. table for a full rotation.

[RIGHT] : Determines the detection position of the T. table by counting the number of slit's tooth of the T. table when the T. table is turned clockwise by a full rotation.

[LEFT] : Determines the detection position of the T. table by counting the number of slit's tooth of the T. table when the T. table is turned counter-clockwise by a full rotation.

When Turn Table Adjust Mode is selected in the Mecha Adjust Mode

```
  ## Turn Table Adjust Mode ##
JOGFWD    : Right 1Step
JOGPRV    : Left 1Step
DMSFWD    : Right 2Step
DMSPRV    : Left 2Step
ENTER     : ENTER -> Exit

STEP      : 12

RETURN:Exit
```

Performs the fine adjustment of the slit position of the T. table using the Jog dial and the DMS (disc selection dial).

[JOGFWD] : Moves the T. table to the right by one pulse. STEP+

[JOGPRV] : Moves the T. table to the left by one pulse. STEP-

[DMSFWD] : Moves the T. table to the right by tow pulses. STEP++

[DMSPRV] : Moves the T. table to the left by two pulses. STEP-

[ENTER] : Determines the adjustment value ad the set value.

STEP : When the T. table is adjusted using the above commands, the adjustment position during each adjustment item is displayed. The initial value is set to 12.

When [PAUSE] is selected in the 300CHG Mecha Con Menu-2

```
 ## Turn Table Offset Debug ##
  NO   |  On   |  Off
   1   |   X   |  XX
   2   |   X   |  XX
   3   |   X   |  XX
   4   |   X   |  XX
   5   |   X   |  XX
PLAY   : Slow Turn (No.5)
STOP   : Turn Stop
PAUSE  : Change PWM

RETURN:Exit
```

[PLAY] : Moves the T. table slowly,

[STOP] :Stops movement of the T. table.

[PAUSE]: Sets the PWM value in the order starting from NO → On → Off.
This mode is prepared for measurement of the load to the T. table as described before. Result of the measurement is not reflected on adjustment. After this mode is selected, Mecha Initial must be performed.

6-6. MECHA AGING

When [3] is selected on this test mode screen, the machine enters the mechanical aging mode. The following screen appears. Do not use this mode.

```
      ### Mecha Aging ###

1.Please Select Aging mode
2.All Mecha : random Aging mode
3.All Mecha : + 1 Move
4.All Mecha : – 1 Move
5.All Mecha : 1 Disc Front
6.All Mecha : 1 Disc Rear
7.TurnTable : Random Move
8.TurnTable : Half Move
9.Door Open/Close

                    Exit:Return
```

6-7. EMERGENCY HISTORY

```
      ### MEG. History ###

Laser Hours     CD   xxxxxxxh
                DVD  xxxxxxxh

1. 00 00 00 00  00 00 00 00
   00 00 00 00  00 00 00 00

2. 00 00 00 00  00 00 00 00
   00 00 00 00  00 00 00 00

Select: 1 – 9  Scroll: UP/DOWN
(1: Last EMG.)  Exit: Return
```

On the Test Mode Menu screen, selecting [4] displays the information such as servo emergency history. The history information from last 1 up to 10 can be scrolled with [↑] key or [↓] key. Also, specific information can be displayed by directly entering that number with ten keys.

The upper two lines display the laser ON total hours. Data below minutes are omitted.

Clearing History Information

Clearing laser hours

◎ Press [DISPLAY] and [CLEAR] keys in this order.
Both CD and DVD data are cleared.

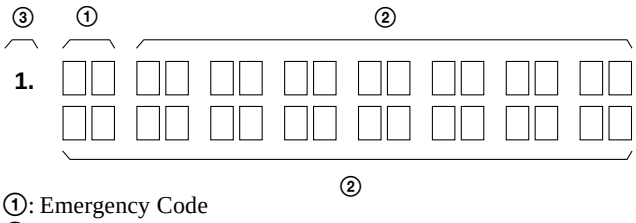
Clearing emergency history

◎ Press [TITLE] and [CLEAR] keys in this order.

Initializing set up data

◎ Press [DVD] and [CLEAR] keys in this order.
The data have been initialized when “Set Up Initialized” message is displayed. The EMG. History screen will be restored soon.

How to see Emergency History



①: Emergency Code
②: Don't Care
These codes are used for verification of software designing.
③: Historical order 1 to 9

Emergency Codes List

10: Communication to IC201 (MB-86 board) failed.
11: Each servo for focus, tracking, and spindle is unlocked.
12: Communication to EEPROM, IC101 (MB-86 board) failed.
13: Writing of hours meter data to EEPROM, IC101 (MB-86 board) failed.
14: Communication to Servo DSP IC404 (MB-86 board) failed, or Servo DSP is faulty.
20: Initialization of tilt servo and sled servo failed. They are not placed in the initial position.
21: Tilt servo operation error
22: Syscon made a request to move the tilt servo to wrong position.
23: Sled servo operation error
24: Syscon made a request to move the sled servo to wrong position.
30: Tracking balance adjustment error
31: Tracking gain adjustment error
32: Focus balance adjustment error
33: Focus bias adjustment error
34: Focus gain adjustment error
35: Tilt servo adjustment error
36: RF equalizer adjustment error
37: RF group delay adjustment error
38: Jitter value after adaptive servo operation is too large.
40: Focus servo does not operate.
41: With a dual layer (DL) disc, focus jump failed.
50: CLV (spindle) servo does not operate.
51: Spindle does not stop.
60: With a DVD disc, Syscon made a request to seek nonexistent address.
61: With a CD disc, Syscon made a request to seek nonexistent address.
62: With a CD disc, Syscon made a request to seek nonexistent track No. and index No.
63: With a DVD disc, seeking of target address failed.
64: With a CD disc, seeking of target address failed.
65: With a CD disc, seeking of target index failed.
70: With a DVD disc, physical information data could not be read.
71: With a CD disc, TOC data could not be read.
80: Disc type judgment failed.
81: As disc type judgment failed, retry was repeated.
82: As disc type judgment failed, a measurement error occurred.
83: Disc type could not be judged within the specified time.
84: Illegal command code was received from Syscon.
85: Illegal command was received from Syscon.

6-8. VERSION INFORMATION

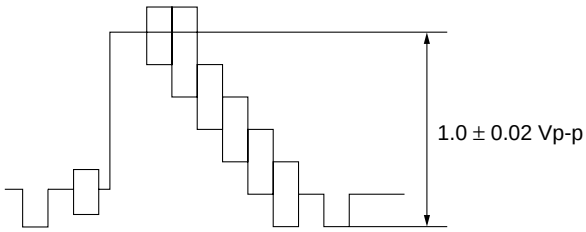
```
   ## Version Information ##

IF con.    Ver. x. xxx (xxxx)
           Group    00

SYScon.    Ver. x. xxx (xxxx)
           Model    xx
           Region   0x
Servo DSP. Ver. 1. xxxx


Exit: RETURN
```

On the Test Mode Menu screen, selecting [5] displays the ROM version and region code.
The parenthesized hexadecimal number in version field is checksum value of ROM.

6-9. VIDEO LEVEL ADJUSTMENT

On the Test Mode Menu screen, selecting [6] displays color bars for video level adjustment. During display of color bars, OSD disappears but the menu screen will be restored if pressing any key.

Measurement point : LINE OUT VIDEO
(75 Ω terminating resistance)
Measuring instrument : Oscilloscope
Adjustment device : RV501 on MB-86 board
Specified value : 1.0 ± 0.02 Vp-p



6-10. IF CON SELF DIAGNOSTIC FUNCTION

1. FR-173 BOARD (IF CON) TEST MODE

The FR-173 board (IF CON) test mode is the IF CON self diagnostic mode. The IF CON can diagnose the functions of the front panel boards that the IF CON controls. Normally, the IF CON makes a serial communication with the SYSTEM CONTROL and operates following thecommands from the SYSTEM CONTROL, but in the Test mode, the IF CON operates independently from the SYSTEM CONTROL.

In the Test mode, the following functions can be checked.

1. Button function
2. Remocon receiving function
3. SYSTEM CONTROL-IF CON serial communication
4. Click shuttle function
5. Fluorescent display tube lighting check
   Grid check
   Anode check
6. LED control function

In the Test mode, the set operates same as usual, except voltage monitoring, communication monitoring, display of fluorescent display tube, and LED control.

1. The routine that monitors +3.3 V (PON CHK) of MB-94 board is not provided.
2. The monitoring timer for serial communication with the SYSTEM CONTROL is not provided. The set is not placed in the Standby mode, even if the communication with SYSTEM CONTROL is normal.
3. Display of fluorescent display tube (normally, display is made following the commands from SYSTEM CONTROL)
4. LED control (normally, control is made following the commands from SYSTEM CONTROL)

2. OPERATION OF SELF CHECK MODE

The Self Check mode is the function to conduct the basic test to the FL display and DVD panel section.

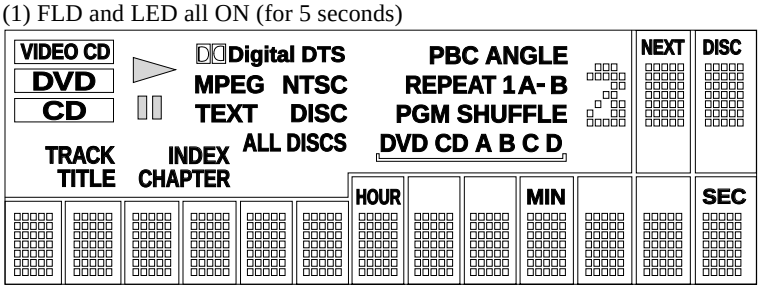
2-1. Self Check Mode Transition Processing

While pressing the [STOP] key on the main unit with the IF CON in STANDBY mode, enter [RETURN] → [DISPLAY] (or [SET UP]) on the remote commander, and the unit transits to the Self Check Mode. The Self Check mode terminates when the IF CON transits to the STANDBY mode.

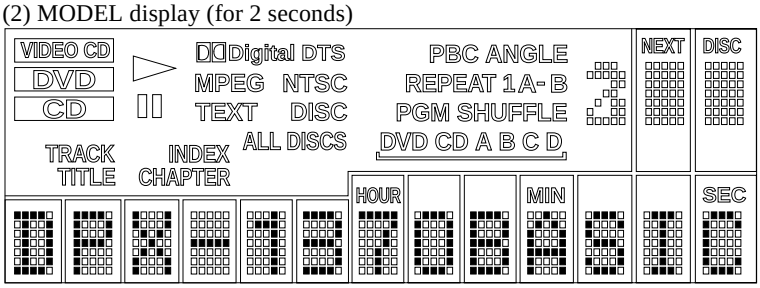
2-2. Operation of Auto Self Check

When the Self Check mode becomes active at the AC Power ON or by key input, the test display of the following steps (1) to (4) is repeated.

(1) FLD and LED all ON (for 5 seconds)

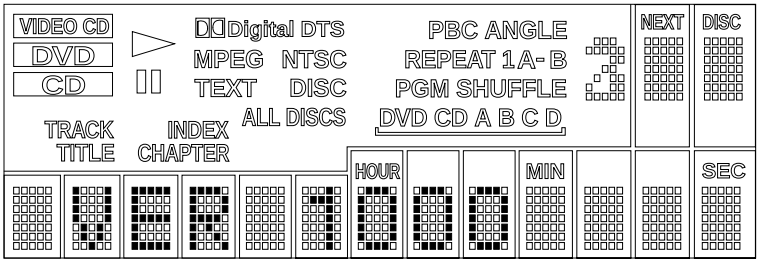


(2) MODEL display (for 2 seconds)

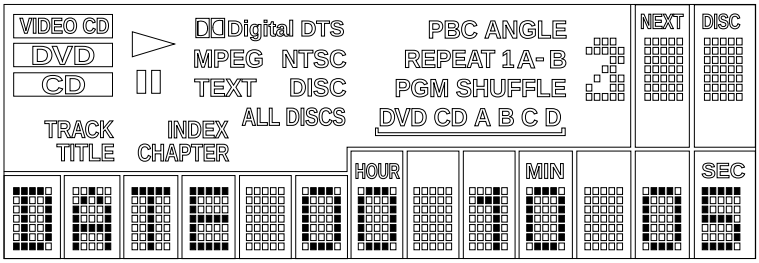


Contents of display
“DPX-1370” Basic
“DPX-1375” DD

(3) Version display (for 2 seconds)



(4) ROM creation date display (for 2 seconds)



2-3. Each Self Check Function

Each Self Check function tests the FLD display, LED display, and key input.

DPX1370 (300-Disc) IC106

No.	Input Voltage (V)	A/D	Resistor	Pin ① (AN5)	HEX	Pin ② (AN4)	HEX	Pin ③ (AN3)	HEX	Pin ④ (AN2)	HEX
0	0 – 0.1	0 – 20	10K(PULL)	STOP	01	EJECT	94	LOAD	8C	SURROUND	7D
1	0.55 – 0.76	113 – 156	1500	PAUSE	02	OPEN/CLOSE	09	REPEAT	0F	DVE/DIMMER	5F
2	1.14 – 1.42	233 – 291	1800	LEFT	07	PLAY	0A	TIME/TEXT	21	FOLDER A	85
3	1.76 – 2.1	360 – 430	2700	DOWN	06	MEGA CONT	23	SHUFFLE	56	FOLDER B	86
4	2.28 – 2.64	467 – 541	3300	ENTER	05	EASY PLAY	91	1/ALL DISCS	8E	FOLDER C	88
5	2.79 – 3.13	571 – 641	4700	UP	04	FLIP	95	TITLE	0E	FOLDER D	89
6	3.34 – 3.62	684 – 741	8200	RIGHT	03	DISC CHANGE	93	DISPLAY	57	FOLDER ALL	90
7	3.85 – 4.06	788 – 831	15K	JOG	08	DIRECT SEARCH	92	DVD MENU	0D	FOLDER DVD	84
8	4.43 – 4.64	907 – 950	56K	ACS-ENTER	2C			RETURN	0F	FOLDER CD	87

2-3-1. FLD and LED All ON

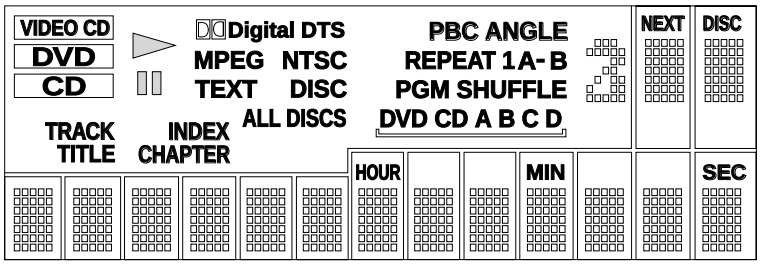
2-3-1-1. Transition Keys in Self Check Mode

- [STOP] key and [PLAY] key on the main unit
- [LEFT] key on the main unit and the remote commander

2-3-1-2. Operation and Display

In this mode, all LEDs except STANDBY LED and all segments of FLD turn ON.

Example of FLD all ON



2-3-2. Main Unit Key Name Display and Key Code Display

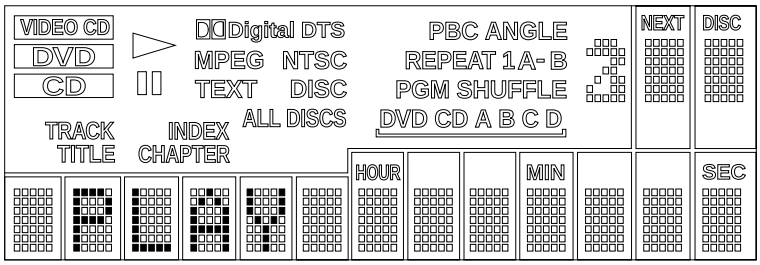
2-3-2-1. Transition Keys in Self Check Mode

- Keys on main unit except keys transited in self check

2-3-2-2. Operation and Display

When a key on the main unit is pressed in the Self Check mode, the name of that key is displayed on the FLD. Also, the key name display and the key code display can be switched with the [DISPLAY] key on the remote commander. “NOTHING” is displayed when nothing is entered. Also, VIDEO CD, DVD, and CD segments turn on when a communication error occurred.

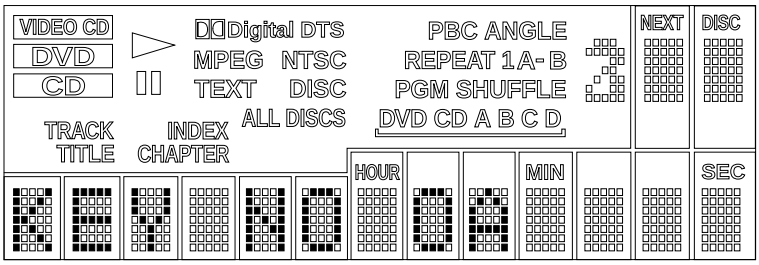
FLD display (at input of [PLAY] key on the main unit)



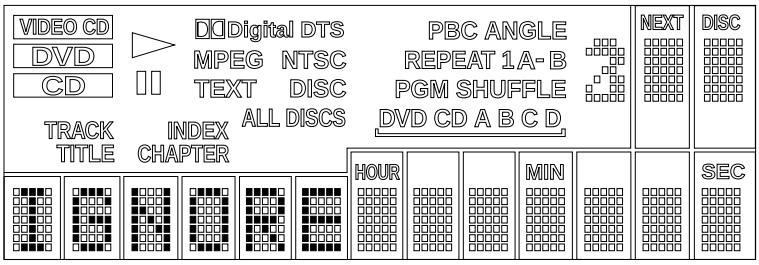
- When the ACS key is used: (Display: ACS TEST ▦)
  The ACS key can be tested by rotating the knob.

- When the ENTER key is used: (Display: KEYBOARD TEST)
  The keyboard input can be tested by connecting the keyboard.

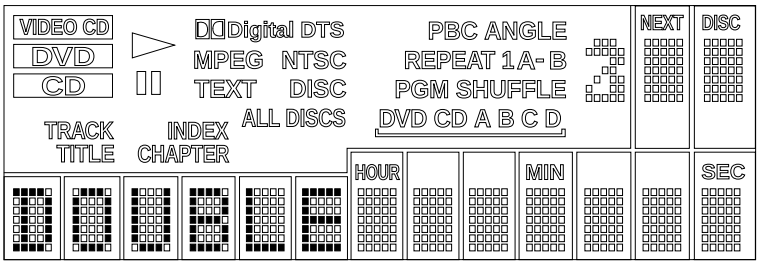
Key code display (at input of [PLAY] key, Key code: 0Ah)



At input of faulty voltage



When two keys are pressed



2-3-3. Remote Commander Key Name Display and Key Code Display

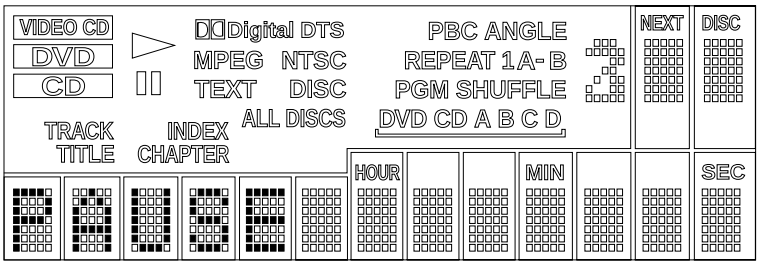
2-3-3-1. Transition Keys in Self Check Mode

- Remote commander keys except keys transited in self check

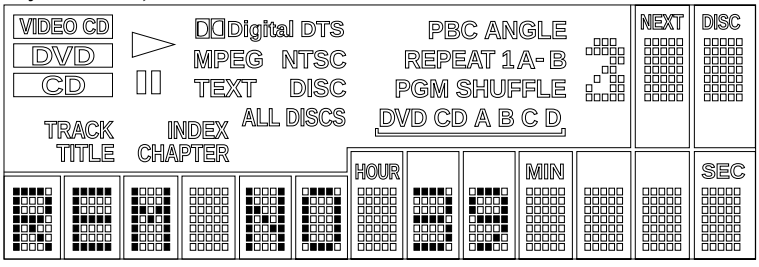
2-3-3-2. Operation and Display

When a key on the remote commander is pressed in the Self Check mode, the name of that key is displayed on the FLD. Also, the key name display and the key code display can be switched with the [DISPLAY] key on the remote commander. “NOTHING” is displayed when nothing is entered. Also, VIDEO CD, DVD, and CD segments turn on when a communication error occurred.

Remote commander key name display (at input of [PAUSE] key)



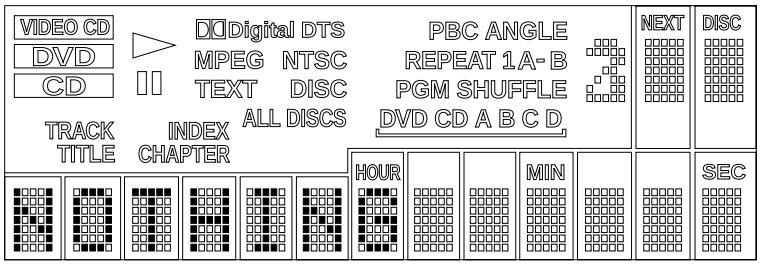
Remote commander key code display (at input of [PAUSE] key, Key code: 39h)



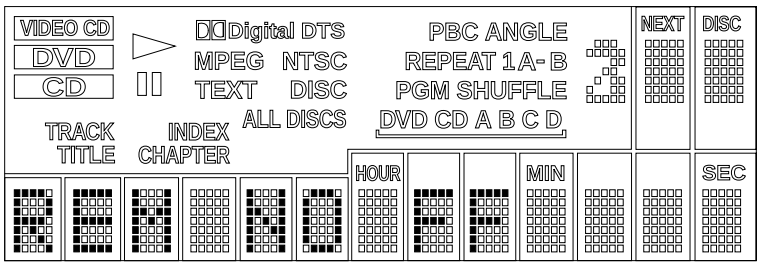
2-3-4. Communication Monitoring Display

The communication state is monitored and displayed while the key name on the main unit and the remote commander is displayed. When the communication to the System Controller failed, VIDEO CD, DVD, and CD segments turn on.

Communication error display (at no key input)



Communication error display (at code display without input of the remote commander)



2-3-5. FLD Anode Test Display and SHUTTLE Click Operation Test

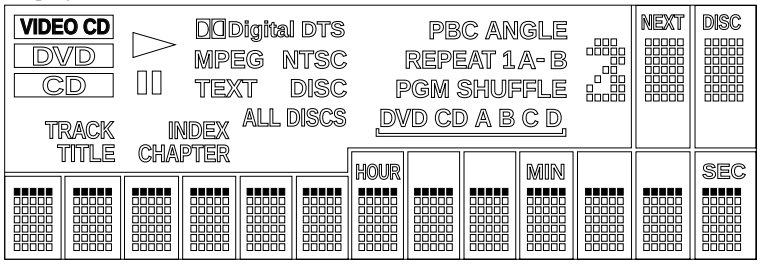
2-3-5-1. Transition Keys in Self Check Mode

- RIGHT on the main unit and the remote commander
- SHUTTLE on the main unit and the remote commander during Anode Test display

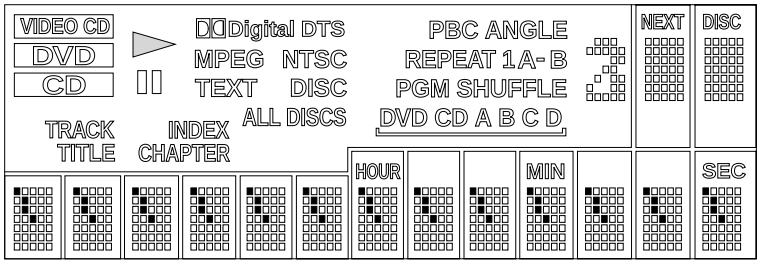
2-3-5-2. Operation and Display

The Self Check mode transits to this mode when RIGHT key is entered. Only the first segment of each grid of FLD turns on, and each time the SHUTTLE is entered, the segment of each grid is switched in order. When SHUTTLE input is clockwise, the segment switches in 1 → 2 → 3 direction, or counterclockwise it switches in 3 → 2 → 1 direction. This tests whether each segment turns on individually. Also, if the main unit does not have the JOG/SHUTTLE, use the remote commander JOG/SHUTTLE to switch over the segment display position.

Display at the start of Anode Test



↓ (Input in CW direction)



2-3-6. FLD Grid Test Display and SHUTTLE Click Operation Test

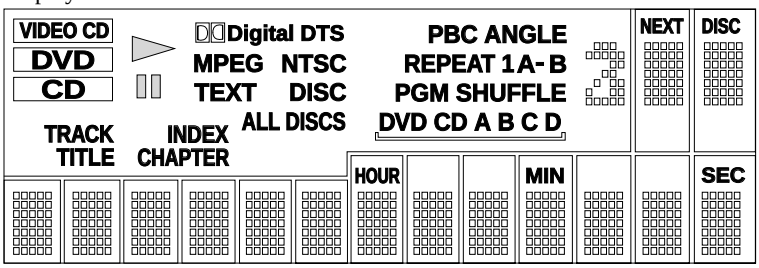
2-3-6-1. Transition Keys in Self Check Mode

- UP on the main unit and the remote commander
- SHUTTLE on the main unit and the remote commander during Grid Test display

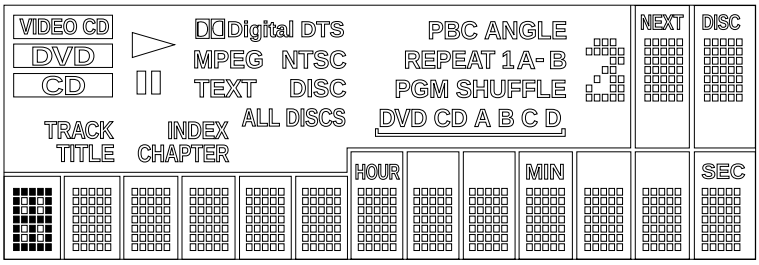
2-3-6-2. Operation and Display

The Self Check mode transits to this mode when UP key is entered. The first grid of FLD all turns on and other grids turn off. Each time the SHUTTLE is entered, the grid is switched in order. When SHUTTLE input is clockwise, the grid switches in 1 → 2 → 3 direction, or counterclockwise it switches in 3 → 2 → 1 direction. This tests whether each grid turns on individually.

Display at the start of Grid Test



↓ (Input in CW direction)



2-3-7. LED Test Display

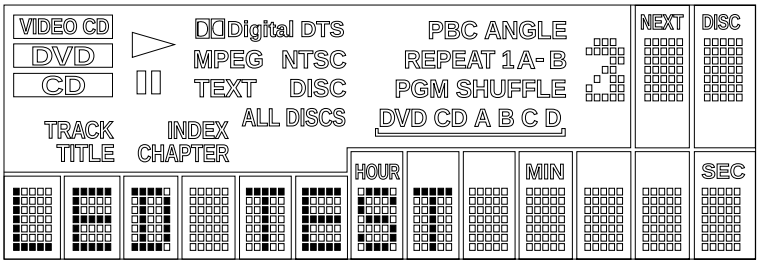
2-3-7-1. Transition Keys in Self Check Mode

- DOWN on the main unit and the remote commander
- SHUTTLE on the main unit and the remote commander during LED Test display

2-3-7-2. Operation and Display

LED is switched in order by the input of JOG/SHUTTLE. Also, LED ON/OFF is switched by the input of same key as the function that turns on the LED concerned. For the MULTI LED only, there is no key which switches that function, and therefore use the RETURN key on the main unit.

FLD display during LED Test



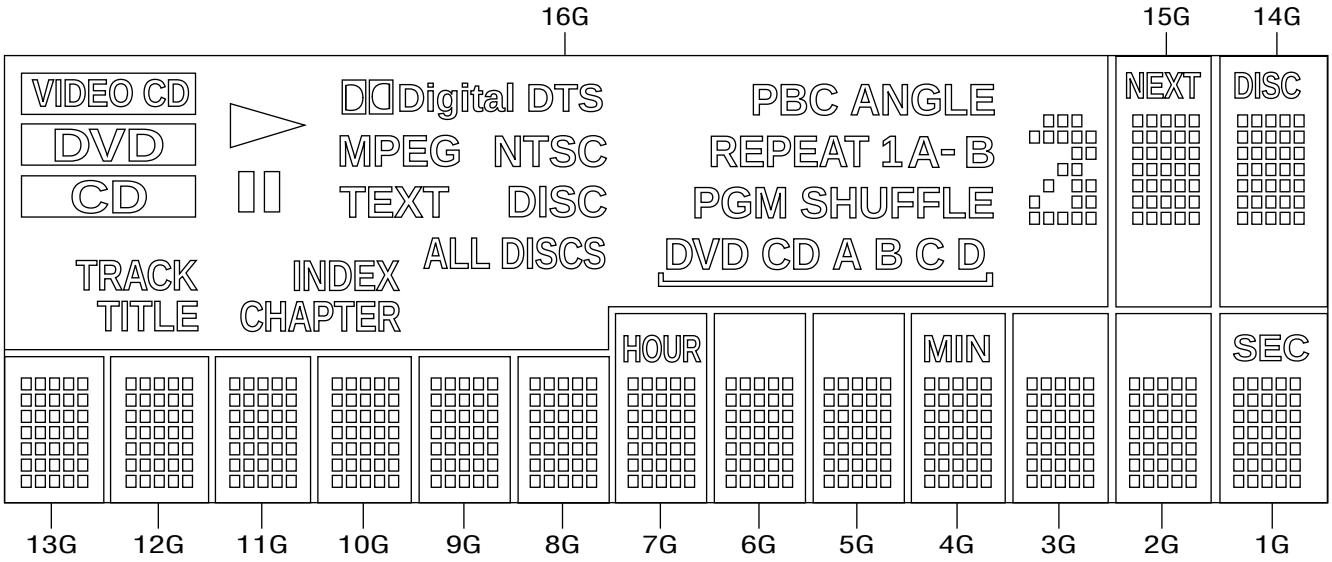
2-3-8. Beep Sound Test

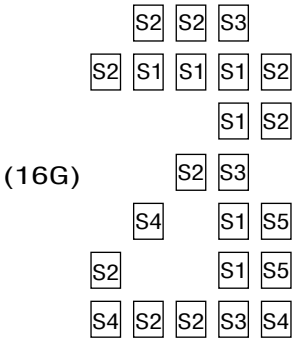
2-3-8-1. Transition Keys in Self Check Mode

- Input of a key on main unit

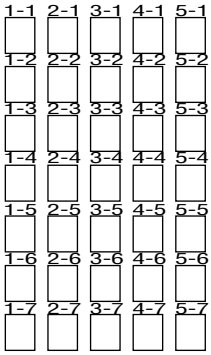
2-3-8-2. Operation and Display

In the Self Check mode, each time a key on the main unit is entered, a beep sound of 2kHz (100ms) is generated.





(16G)



(15G to 1G)

ANODE CONNECTION

	16G	15G	14G	13G to 8G	7G	6G to 5G	4G	3G to 2G	1G
P1	VIDEO CD	1-1	1-1	1-1	1-1	1-1	1-1	1-1	1-1
P2	DVD	2-1	2-1	2-1	2-1	2-1	2-1	2-1	2-1
P3	CD	3-1	3-1	3-1	3-1	3-1	3-1	3-1	3-1
P4	TRACK	4-1	4-1	4-1	4-1	4-1	4-1	4-1	4-1
P5	TITLE	5-1	5-1	5-1	5-1	5-1	5-1	5-1	5-1
P6	▷	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2
P7	▯▯	2-2	2-2	2-2	2-2	2-2	2-2	2-2	2-2
P8	CHAPTER	3-2	3-2	3-2	3-2	3-2	3-2	3-2	3-2
P9	INDEX	4-2	4-2	4-2	4-2	4-2	4-2	4-2	4-2
P10	Digital	5-2	5-2	5-2	5-2	5-2	5-2	5-2	5-2
P11	DTS	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3
P12	PBC	2-3	2-3	2-3	2-3	2-3	2-3	2-3	2-3
P13	ANGLE	3-3	3-3	3-3	3-3	3-3	3-3	3-3	3-3
P14	S1	4-3	4-3	4-3	4-3	4-3	4-3	4-3	4-3
P15	S2	5-3	5-3	5-3	5-3	5-3	5-3	5-3	5-3
P16	S3	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4
P17	S4	2-4	2-4	2-4	2-4	2-4	2-4	2-4	2-4
P18	S5	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4

	16G	15G	14G	13G to 8G	7G	6G to 5G	4G	3G to 2G	1G
P19	MPEG	4-4	4-4	4-4	4-4	4-4	4-4	4-4	4-4
P20	TEXT	5-4	5-4	5-4	5-4	5-4	5-4	5-4	5-4
P21	NTSC	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5
P22	REPEAT	2-5	2-5	2-5	2-5	2-5	2-5	2-5	2-5
P23	[REPEAT] 1	3-5	3-5	3-5	3-5	3-5	3-5	3-5	3-5
P24	A-	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5
P25	B	5-5	5-5	5-5	5-5	5-5	5-5	5-5	5-5
P26	▭	1-6	1-6	1-6	1-6	1-6	1-6	1-6	1-6
P27	DVD	2-6	2-6	2-6	2-6	2-6	2-6	2-6	2-6
P28	CD	3-6	3-6	3-6	3-6	3-6	3-6	3-6	3-6
P29	A	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6
P30	B	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6
P31	C	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7
P32	D	2-7	2-7	2-7	2-7	2-7	2-7	2-7	2-7
P33	ALL DISCS	3-7	3-7	3-7	3-7	3-7	3-7	3-7	3-7
P34	DISC	4-7	4-7	4-7	4-7	4-7	4-7	4-7	4-7
P35	PGM	5-7	5-7	5-7	5-7	5-7	5-7	5-7	5-7
P36	SHUFFLE	NEXT	DISC	–	HOUR	–	MIN	–	SEC

3. TROUBLESHOOTING

3-1. Test Mode is not activated

With the set assembled in the front panel, the Test mode does not become active if any button was pressed by any reason.Under this condition, the power is not turned on even in the normal status. (The set is kept in Standby status = Red LED is kept on) Not only the buttons are inactive, but also a signal from remote commander is not accepted. The IF CON checks the self check port only after the power on reset (only when AC is supplied; not in Standby status). If any button was pressed, the button name should be displayed on the FL display tube. Though no button is pressed this time, display of other than NOTHING implies that the button was pressed.

3-2. Power is not turned on

① Red (STANDBY) LED does not light up when AC was supplied. The power (EVER 5.0 V) is not supplied.
X101 is not oscillating.

② Red (STANDBY) LED is kept on though POWER button was pressed. Any button is kept pressed.
PONCHK (IF CON pin ⑥) is over 0.1 V.

③ Green LED lights up when POWER button was pressed, but red LED lights up again after several seconds. PONCHK (IF CON pin ⑥) is abnormal. (Slow rise time from 0.1 V to 1.5 V. Voltage must be less than 1.5 V)
SYSTEM CONTROL does not operate normally.